AMERICAN JOURNAL of VETERINARY MEDICINE

PUBLISHED MONTHLY. Copyright 1913 by D. M. CAMPBELL, CHICAGO, U. S. A.

Vol. VIII JUNE, 1913 No. 6

Tetanus Antitoxin, Its Discovery, Production and Therapeutic Use

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TETANUS is a disease which has for many years caused considerable loss in horses, cattle, sheep, hogs, etc., as well as in human beings. It is found more frequently in tropical and semi-tropical climates than in the northern regions. Its occurrence, however, over the whole of the United States and most of Europe is quite sufficient to cause considerable loss. The tetanus bacillus is found in all kinds of soil, but seems to grow more frequently in certain localities, as, for instance, Long Island is notorious for its tetanus affections. The natural habitat of this organism is the alimentary tract of horses and cattle. It is, therefore, almost always to be found in stable litter, and in a large percentage of cultivated grounds; hence all wounds received in or about stables, corralls, etc., should be looked upon with suspicion.

The bacillus of tetanus exerts its pathological influence through a very powerful toxin which it secretes in its growth. This toxin acts directly upon the nerves, causing localized or general muscular spasms according to the severity of the attack.

The predominant poison of tetanus toxin, known as tetanospasmin, possesses a powerful affinity for the nerve cells and on being bound to them produces the well known muscular spasms. In addition to this Ehrlich found another substance capable of producing solution of the red blood corpuscles. In this he applied the name etanolysin.

The body in defense of itself throws out into the circulation antitoxic molecules which also possess an attraction for the toxin molecules, thus binding them fast before they can reach the nerve cell and rendering them harmless. Unfortunately however, the body does not in most cases produce for itself enough of these antitoxic bodies to stem the current of the affection. Of this antitoxin I shall speak more fully below.

Discovery of the Tetanus Bacillus

For many years it was thought that tetanus was caused by severe mechanical injuries to the peripheral nerves, as its occurrence was usually noted after some such injury. Experimenters were, however, unable to artificially produce the disease in this manner. Later it came to be more properly regarded as intoxication. The first great step towards the light of discovery was in 1884, when Nicolaier inoculated garden earth into rabbits and guinea pigs and thus produced fatal symptoms.

Five years later Kitasato isolated from garden earth and grew upon artificial media the bacillus for the first time. The fact that this bacillus is a strict anaerobe added greatly to the difficulty with which it was obtained on culture media. The presence

of a toxic substance in both pure and mixed culture was demonstrated by Brieger, Faber and others. Finally in 1892 Behring and Kitasato succeeded in immunizing animals to tetanus. The blood of animals thus immunized was found to contain a substance (the antitoxic bodies) possessing the power of neutralizing the specific toxin. The explanation of such large amounts of antitoxin found in the blood of animals which have been immunized and treated therafter with frequent ascending doses of toxin is that the body in endeavoring to combat this toxin throws out into the circulatory system a great many more of these receptor cells than is really necessary.

A similar instance of this lavishness of nature may be observed in an ordinary fracture, herein endeavoring to replace the tissue which has been destroyed. An excessive amount is formed, producing that well-known enlargement the socalled callus.

Immediately upon the value of this antitoxin being demonstrated it was brought into very popular favor for therapeutic use. It was one of the first of a rapidly growing list of biological products, being practically the pioneer of serum therapy.

The manufacture of various biological products for both veterinary and human use has become an industry of considerable magnitude; but with the exception of those directly connected with this industry, very little seems to be known of the methods employed. Therefore, it is my intention to set down here a brief description of the process as carried out in the laboratories with which I am associated. These methods may be considered typical of those being used all over the world today, being the most up to date and efficient and I trust that this may give the readers of VETERINARY MEDICINE some idea of the work and expense which is represented by each dose of tetanus antitoxin used by them.

Production of Tetanospasmin

To begin at the beginning, the first thing necessary in the production of antitetanic serum is the toxin wherewith to immunize the horse. This is procurred with some difficulty by growing the bacillus of tetanus in its pure culture upon a glucose bouillon for from six to sixteen days at an almost constant temperature of 37° C. This organism being a strict anaerobe must be grown in an atmosphere free from oxygen. At the end of the incubation period the flasks containing these cultures are removed from the incubator, and the bouillon is filtered through a berkfeld clay filter. The filtrate obtained contains the specific toxin, free from all bacilli and spores. The potency of this toxin is extremely high in many cases, one cubic centimeter is sufficient to kill 10,000 guinea pigs weighing 350 grams each. It is estimated to be about twenty times as poisonous as a cobra's venom. This potency is determined by injecting various dilutions into several guinea pigs weighing about 350 grams. The amount necessary to kill one of these animals within five days is called the fatal dose. The potency is then expressed in the number of fatal doses to one Cc. as for instance 1:5000. The bacillus does not always readily produce its toxin, and very often several batches may be run before one of a sufficiently high potency is obtained. Today the toxin below one to one thousand is very seldom used. The usual strength is from 1:5000 to 1:10,000.

Selection of the Serum Horse

When it was found that the horse might be immunized to tetanus he was chosen,

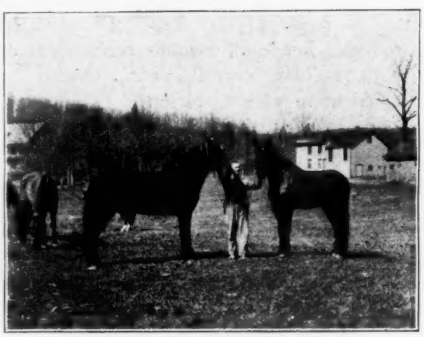

Fig. 1. Dick and Prince, two horses producing very high grade antitetanus serum

for the animal from which tetanus antitoxin was to be commercially produced. Horses

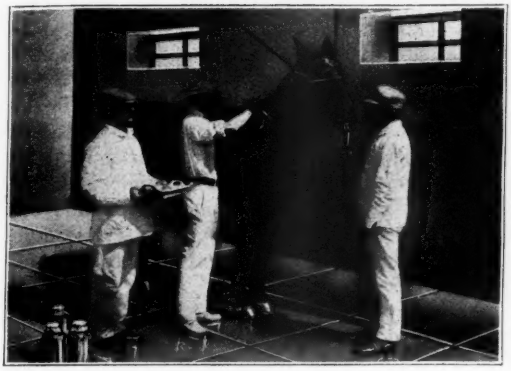

Fig. 2. Injecting a horse with the specific toxin of the tetanus bacillus

selected for this purpose are all strong, healthy animals which have undergone clinical supervision and very careful tests with regard especially to glanders. Needless to say no animals are ever accepted that show any sign of disease. Lameness, caused by sprain, founder or some such simple defect does not interfere with the horse's usefulness in this line. Animals with cardiac trouble or respiratory embarrassment, such as heaves, do not withstand the treatment at all; and when found to possess such defects are always rejected.

The stable accommodation for antitoxin horses is arranged with great care as regards general sanitary conditions. Buildings are constructed in the most simple form, all fixtures being plain and serviceable. Plenty of light and good circulation of air is arranged for. These stables and the animals themselves are kept scrupulously clean. In short, every precaution is taken for comfort and sanitary protection.

The beginning of treatment upon a horse is carried out in the following manner:

Preparation of the Serum Horse

He is first injected subcutaneously with several thousand units of tetanus antitoxin, followed with a relatively small dose of toxin. A few days later a slightly increased dose of the toxin is again administered, and then again in a few days the general reaction having abated, another dose is given, and so on in ascending doses for a period of two or three months. Very often a horse is found which does not produce enough antitoxin to warrant his being retained under treatment. Those which do produce sufficient amount are retained sometimes for several years.

The amount of antitoxin produced is ascertained by drawing off a small quantity of serum, which is then tested with a

Fig. 3. Bleeding a serum producer

standard toxin upon guinea pigs. One antitoxic unit is that amount which will save a 350-Gram guinea pig from 1000 fatal doses of tetanus toxin. A horse producing from 200 to 250 antitoxic units percubic centimeter is considered very good.

Bleeding

The animal having reached a point where bleeding is auspicious, about 8 to 12 liters of his blood are drawn off. This is

Fig. 4. Filtering—the contents of the vessels shown in the foreground is waste matter which has been eliminated from the plasma

done by means of a short cannula inserted into the jugular vein. A piece of rubber tubing attached to this cannula conducts the blood to a bottle in which there is a solution of sodium citrate, which prevents its clotting. These bottles containing the blood are allowed to stand for about twenty-four hours, during which time the red and white cells, in fact all floating matter, settles to the bottom, leaving the plasma at the top where it may be siphoned off. This plasma contains the antitoxic bodies. The sediment in the bottom of the bottles is merely refuse. It might well be expected that drawing off such an apparently large amount of blood would greatly weaken the animal. This, however, does not seem to be the case. As a rule there is no perceptible change in his manner; the heart action is practically regular as is also the respiration, and the appetite as a rule remains unimpaired.

On the day following the bleeding the injecting is taken up again, several doses being administered, and then another bleeding is performed. From eight to ten days are allowed to intervene between the last injection of toxin and the bleeding. This permits all of the toxin in the system to be fully absorbed and bound by the receptor cells, and the antitoxic contents of the blood is then at its highest.

The Serum Producer's Lot Not a Hard One

Horses on tetanus treatment retain their usefulness for several months, sometimes even for years, being bled on an average of twice a month. The potency of the serum, however, gradually decreases until it becomes practically worthless.

Improvement in the Antitoxin

In the beginning of serum therapy the crude serum was injected. For several reasons this was inconvenient. First it required a large volume of fluid to give the required dose. In many instances it was necessary to inject from 20 to 30 Cc. at a time. Of course for human inoculation this was rather more objectionable than in veterinary practice; but even so it makes a good bit of difference on injecting a restless horse whether 5 or 25 Cc. are required.

Refining and Concentrating the Plasma

A great deal of experimenting was done to discover some method of reducing the volume and eliminating the extraneous matter from the antitoxin. Gibson of the New York Department of Health Laboratories was the first to work out a practical method of accomplishing this. In 1905 he introduced a process by which the globulin containing the antitoxin was precipitated with saturated ammonium sulphate. This precipitate was placed in a saturated sodium chloride solution and the globulins, antitoxic and non-antitoxic were thus

separated. This antitoxic globulin solution was from two to three times the strength of the original plasma and was widely used until 1908. In the course of that year Dr. Banzhaf of the same laboratories brought to a close his experiments in heating the antitoxic plasma. The protein distribution in the blood of an immunized horse is something as follows: albumin, 12 percent, pseudoglobulin con taining the antitoxin, 78 percent; and englobulin 10 percent. After heating the plasma for from twelve to fifteen hours at 57° C., Banzhaf found that the following rearrangement had taken place, albumin, 9 percent; pseudoglobulin, containing the antitoxin only 50 percent; and the englobulin increased to 41 percent. All of the antitoxin excepting 7 percent lost in the heating was found in the pseudoglobulin. Some objections have been raised in regard to employing this process, in the commercial production of antitoxins, based upon the seven percent loss caused by it. The fact remains, however, that it is not possible to obtain a high concentration with a low total solid content, if the heating is not carried out.

By using the following Banzhaf method, a

Fig. 6. Filling aseptic glass syringes with the finished antitoxin

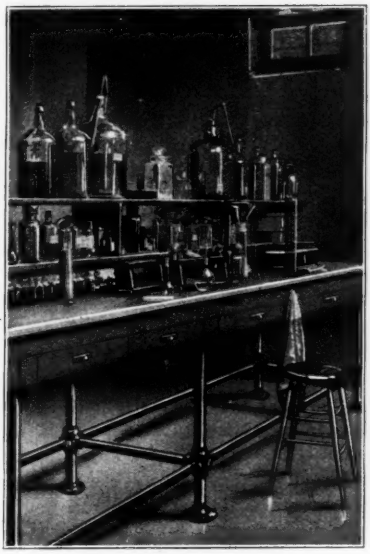

Fig. 5. A section of the laboratory in which much of final testing is carried out

concentration of from five to six times in place of a concentration of two to three times as was the case previous to the introduction of heating. The plasma having been drawn off, is diluted with water and heated, as stated above for fifteen hours at a more or less constant temperature of 57° C. The globulins are then precipitated with saturated ammonium sulphate solution. This precipitate is placed in a saturated solution of sodium chloride. In this solution the pseudoglobulin is soluble, while the englobulin is insoluble, they may be separated by filteration. The pseudoglobulin, containing the antitoxin, may be precipitated out of the filtrate with dilute acetic acid. The moisture is all pressed out of this precipitated, most of the soluble salts are naturally eliminated in this pressing. After pressing the dry mass obtained is then dialysed to remove all remaining salts, the reaction is then corrected and the solution brought up to the normal salt constituent of the blood, after storage in the ice chest for about two weeks.

Determining the Potency a Difficult Process

Then follows a long and careful process of testing. First come the bacteriological

tests, to determine whether or not the product is free from bacteria. No product is placed upon the market which is not absolutely sterile. The sterility having been proven, the total solid content is determined. This usually runs from seventeen and one-half to twenty percent. To discover the potency of the antitoxin it is tested against a toxin of known strength. This toxin is sent to the various laboratories by the United States Public Health Service. A certain amount of this toxin constitutes the L + dose or that amount which when mixed with one antitoxic unit will kill 350 Grams of guinea pig in three days. This testing is extremely delicate and must be carried out with great care. It often requires several weeks and a number of guinea pigs to conclusively determine the potency of the product.

Use of the Antitoxin

Tetanus antitoxin is of greatest value as a prophylactic, whereas if not given until symptoms of tetanus appear its efficiency is not so great. The reason for this is the great affinity possessed by the nerve cells, for the toxin molecules. When once this binding has become sound it is impossible to break away the toxin by the injection of antitoxin. The symptoms of course never set in until sufficient toxin has been bound to produce intoxication; however, many cases are discovered early enough to save the patient, if further binding be prevented by the immediate introduction of antitoxin.

Since infection can only take place through a wound of some kind there are many instances where tetanus may be prevented by prophylactic treatment. As it is rather difficult with animals to keep wounds in a strictly aseptic condition, I should recommend the use of antitoxin in *all* wound cases, no matter how insignificant the injury may seem.

Puncture wounds, made by rusty nails, rake teeth or similar objects and penetrating to a considerable depth; crushing fractures where a great deal of the subcutaneous tissue has been destroyed and perhaps contaminated with earth; and such operations as tail docking and castrating are particularly likely to result in tetanus, if antitoxin is not given. The immunizing dose should be not less than 750 units, preferably 1500 units. If all suspicious cases were thoroughly protected, many thousands of dollars worth of stock might be saved.

In our laboratory stables we make it a rule to give every horse, not under tetanus treatment, a dose of 3000 units every three months.

When a case of tetanus is discovered in the early stage of the disease, before generalized muscular spasms have set in, prompt action will as a rule save the patient. It should be borne in mind that every moment's delay provides a chance for still more toxin to be absorbed. The antitoxin should be given at once; if only a small amount is available, give that and obtain a sufficient amount as soon as may be.

Recent experiments show that the full quantity of a subcutaneous injection is not absorbed within thirty-six hours. It may therefore be seen that it is much better to give a large initial dose—20,000 to 30,000 units, followed by similar doses at intervals of twenty-four hours; or if the severity of the attack is seen to abate the following doses may be reduced, than it is to give a small initial dose—5000 to 10,000 units, followed by similar doses every twelve to eighteen hours.

Where rapid absorption is desired intravenous injections are much preferable to subcutaneous injections. The wound, if it can be found, should not be neglected. The tetanus bacillus being a strict anaerobe is naturally favored by the exclusion of the air. Hence the wound should be kept open and allowed free drainage. Actual cauterizing if thoroughly done may be found of advantage.

In desperate cases, where the symptoms are well advanced, Ransom and Meyer recommend exposing some of the larger nerves and infiltrating them with antitoxin; also drawing off an amount of the cerebrospinal fluid, by means of lumbar puncture, and replacing it with antitoxin has been found of value. It is thought that in this way some of the toxin molecules not thoroughly bound, may be broken away.

Either procedure should be supplemented by intravenous or subcutaneous injections. For intravenous administration the antitoxin should be warmed to about 39° C., slightly above body temperature.

It should be remembered that the first injection is of the greatest importance, and that the promptness with which it is given, and the rapidity with which it is absorbed goes a long way towards bringing about a happy termination of the infection in cases of tetanus.

Three Interesting Cryptorchid Cases*

By FREDERICK HOBDAY, F. R. C. V. S., Kensington, W., London, England

THE curiosities and anomalies met with by the "Rig" operator are many, and three which have been recently

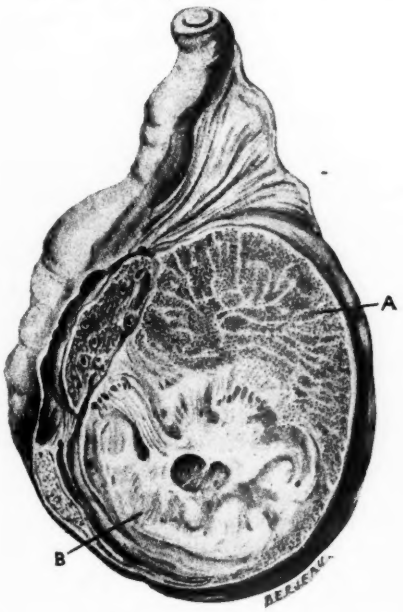

Fig. 1. Cystic Embryoma of the Testicle. A, Tumor tissue with body of the testicle on the left; B, Cyst cavity

met with have been sketched and are reproduced here. For the pathological examination and descriptions I am indebted to Sir John Bland Sutton, F. R. C. S.

Case 1. Was removed from a Shire colt, three years old. The left testicle was in the scrotum and weighed ten and one-half ounces, the right one being in the abdomen and weighing one pound nine ounces.

*Reprinted from *The Veterinary Journal*, March, 1913.

It was much enlarged and contained cystic fluid with several pieces of cartilage and bone.

The pathological description is as follows:

Cystic Embryoma of the Testicle

This is a specimen (Fig. 1) of unusual interest; it is as large as a cocoanut. On dividing it in a sagittal direction the bulk

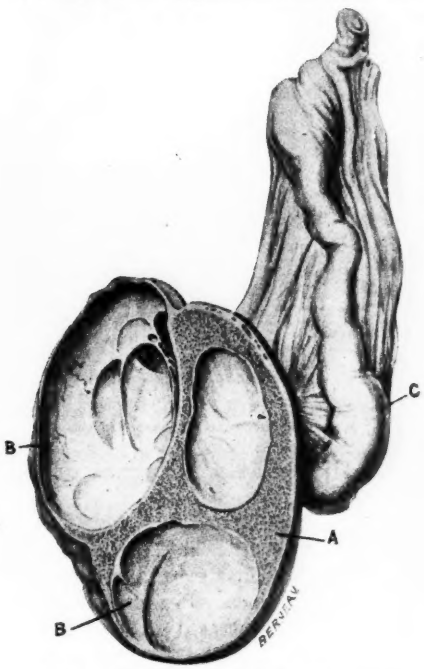

Fig. 2. Cystic Testicle. A, Testicular tissue; B, B, Cysts; C, Epididymis

of the tumor consists of a large cavity filled with fluid, and on its floor there is a lobulated solid tumor the size of a duck's

egg enclosed in a thin osseous capsule. The epididymis is easily seen; a small body lying on the wall of the cyst represents the body of the testis, and on microscopic examination seminiferous tubules are easily seen.

The tumor is an embryoma contained in a cyst and replacing the paradidymis. The solid bone-encapsuled body contained within the cyst is made up of embryonic tissue containing secreting glands, tracts of bone, and cartilage.

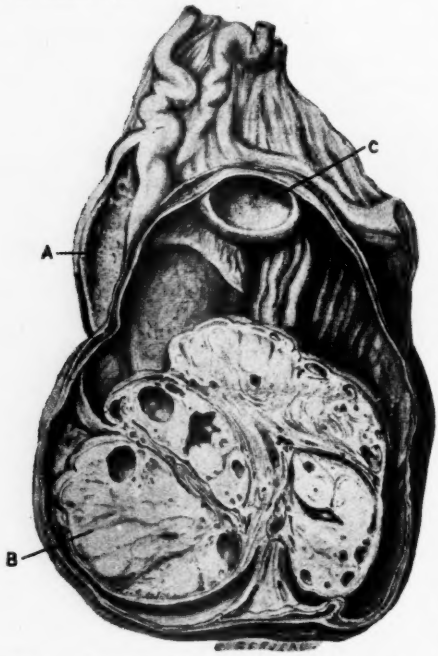

Fig. 3. Embryoma of the Testicle. A, True testicular tissue; B, Tumor tissue; C, Cyst

A cystic testicular embryoma of this nature is a rarity.

Case 2. This was removed from a Shire colt, thirteen months old. The left testicle was in the inguinal canal and the right one in the abdomen. It weighed two and one-half pounds after the fluid was removed. This latter process was done by scratching the cystic portion through with the finger nail whilst in the abdomen; as it was too large to be removed, unless an enormous wound had been made, before this was done.

The pathological description is as follows:

Cystic Testicle

In the drawing, the testicle is represented in sagittal section. The body of the testis is as big as a turkey's egg, and contains three cysts filled with yellow fluid. The cysts are separated from each other by narrow strands of tissue containing seminiferous tubules. The cysts are lined with dense fibrous tissue devoid of epithelium.

Cystic disease of the body of the testis, as seen in this specimen, is not uncommon in rams.

It has nothing in common with the condition known as general cystic disease of the testis in man, for in the latter the disease arises in the paradidymis, between the body of the testis and epididymis, and though the secreting tissus of the testicle is compressed by the tumor the cysts never invade it.

Case 3. A bay Shire colt, two years old. The right testicle was in the abdomen, and weighed one and one-half pounds.

The pathological description is as follows:

Embryoma of the Testicle

This testicle is about the size of a duck's egg, and the relation of the various parts is represented from a sagittal section of the organ. The testis and epididymis are widely separated from each other by a mass of tissue having the naked-eye features of fat. This block of tissue compresses the proper tissue of the testis which lies flattened around the periphery of the fat-like mass which replaces the paradidymis. Microscopically the tumor contains the mixed elements of an embryoma. The tissue itself is embryonic in character, and collections of glandular tissue resembling the secreting glands of the skin are fairly abundant. Neither hairs nor teeth were detected in the sections.

Each of the horses made a good recovery, and there were no complications to cause anxiety. The operations were done under chloroform, and in each instance the only method of preparation was to paint the skin with tincture of iodine, no soap and water being used at all.

Case 2 is interesting as illustrating that the fluid contents were aseptic, as a considerable quantity escaped directly into the abdominal cavity; this, however, has been observed before both by myself and by other writers.

The Kansas Horse Plague a New Disease

By M. A. PURDY, M. D. C., Shelbyville, Kentucky

EDITOR'S NOTE.—Doctor Purdy has written many articles for the public press on the general subject of trypanosomsis. This article on the Kansas Horse Plague was prepared for use in the January issue of VETERINARY MEDICINE, *but for lack of space it has been necessary to defer its publication until this time. The article is one, however, that has not lost in interest because of the delay in its publication.*

ALTHOUGH many articles have been written declaring that the horse scourge in Kansas and adjoining states last fall is not a new-world disease, to my mind it is by no means an old disease to America, although it may have existed in some of the southern states for several years, unnoticed because that region is so sparsely supplied with veterinarians.

In Kentucky, where I have practiced for years, this disease first came to my notice three years ago, when I had several cases all typical and fatal.

In November, 1911, I had several cases, all typical and nearly all fatal, styled by some as "Forage Poisoning," and said to be due to eating moldy corn and the prediction was made that it would disappear when heavy frosts came; but instead of this being the case, we had more than ever the following mid-winter and early spring, notwithstanding we had had near zero weather for several days during the winter. Immediately after this cold spell, I had most of my cases and it was thought by some that when the good old springtime sun and the gentle Easter flowers appeared that the disease would surely disappear; but instead there was more of it than ever and Kentucky lost over a thousand horses.

At this time I predicted in the *Louisville Courier Journal* that "In the near future America would be visited by this same scourge that would cause more deaths to the animal kingdom than any scourge that has yet made its appearance." The experience in the middle west last fall fully justifies this prediction.

That this disease has appeared to many as forage poisoning, I have no doubt, but it has never appealed to me as such, except that both diseases the animal dies in syncope, but all other symptoms are radically different.

Comparing the two diseases as to susceptibility, semeiology and etiology we have the following:

Camparative Susceptibility of Forage Poisoning and "The New Disease"

First. Let a number of people partake of ice cream that contains a ptomain poison, or any other substance that contains a similar poison, and nearly all of them are made sick, and at nearly the same time. Or another—feed horses or mules on ensilage or any other food that contains fungi that produce forage poison and nearly every animal that eats of it will surely succumb and perish, and all near the same time. Therefore the susceptibility in forage poisoning is very high.

Second. On the contrary with the "New Disease" only susceptible animals are affected and the susceptibility is very low. The disease appears on highlands and lowlands alike, and at all seasons, spring, summer, autumn and winter, but mostly during mid-winter and mid-summer. Remember this, as I will have occasion to refer to this phase again.

Take, say, ten or a dozen horses, all on the same farm eating the same food and drink under the same environment, and usually only one or two animals will be affected, and moreover seldom if ever, at

the same time. Sometimes these cases will come a month apart.

The disease will skip over several farms in a scourged district, only to renew its attack in a new territory, and at the same time the susceptibility is very low. Sometimes the disease will affect only one horse among, say, twenty on a farm; again it may affect two horses on an adjoining farm, where there are only four or six horses, and this irregularity of attack has been my experience with it throughout. I have attempted to describe the degree of susceptibility as far as my experience will permit.

A Comparison of the Semeiology

First. Forage poisoning is ushered in by chill, followed by a high fever, ending in subnormal temperature. There is great depression throughout the attack; paralysis first of the organs of deglutition, then of organs of prehension, first the tongue, then the lips. A staggering gait similar to locomotor ataxia, caused by the great depression, ending in paralysis of nearly the entire organism. They never gyrate to one side in particular, seldom live over three days after attacked and usually die sooner than that. Early in the disease they seek recumbency and show colicky pains; respiration is shallow, and the pulse fast, hard and wiry at first and then soft and full before the end. The urine is scanty and high colored, the visible mucous membranes, at first are a deep red without petechiae, followed by a faint icteric condition in most all cases before death, when they die in syncope.

Second. The "New Disease" affects the central nervous system, and is acute and sub-acute in its attack. Producing at first, several days in advance of the acute symptoms, a marked petechiae and hemorrhagic splotch or splotches usually found in various sizes deep down on the membrana nictitans, very faint in character, nevertheless they usually make their appearance on the second or third day and are quite visible. There is usually only one splotch. In from seven to ten days the animal will manifest a brain involvement very sudden in its attack, showing clonic spasms, first of the muscles of the neck. Then the back, then the organs of prehension and deglutition, being in a state of excitement nearly the entire duration of the disease. The animal will have short periods of calmness and will eat and drink when these clonic spasms are not on, and take full gulps of water showing that the organs of deglutition are not paralyzed. There is also a skin manifestation in the cases that recover; the skin becomes dry and harsh and an eruption along the lower part of the neck and breast and also over the lumbar and gluteal muscles. In grey horses the skin will become depigmented, the hair falls off and is very slow to grow back again, grows very unevenly in some places and will be very long when they shed their coat. The shedding is very irregular, leaving a rough shaggy looking aspect, showing a disturbance at the nerve endings.

At the onset of the disease, in the exciting stage, there is an elevation of temperature, lasting from six to ten hours when it suddenly drops to sub-normal when the acute exciting stage gives way to a partial comatose stage. While in this state they will be seen to prop their body against objects and when made to move will gyrate to one side. The pulse at first is quick and full, becoming double in the last half of the acute stage, then becoming very wiry and slow and irregular; sometimes skips several beats, then in quick succession becomes very fast, then back slow and irregular; respiration not much disturbed at first, but as the disease progresses becomes labored and then very slow and the breathing is stertorous. The animal at this stage seeks recumbency, passing into convulsions with head drawn back and violent movement of the legs, with eyes staring sometimes with one eye closed and the other wide open, one pupil dilated and the other contracted when death closes the scene. They die in syncope.

First. In forage poisoning the following are the autopsy findings: Blood and meninges normal, stomach, liver, spleen and bowels are normal. There is a congestion (possibly passive) of the peripheral vessels

of the cerebellum. The heart muscle is soft and flabby, pericardium partly filled with fluid; the heart looks as though it had been "parboiled," dorsum of tongue is very much swollen, lymph glands hemorrhagic and soft. The cerebrum, excretions, medulla and spinal cord, kidneys, musculature, cutis and sub-cutis, lungs, blood vessels, and bone marrow are normal.

Second, In the "New Disease" the heart muscle is firm but hypertrophied; the pericardium shows petechia; lymph glands are large and hemorrhagic; the excretions normal; the kidneys and capsule show petechia; musculature normal; cutis and sub-cutis echimotic; lungs and pleurae show petechial areas; blood vessels normal; bone marrow abnormally red, especially of the long bones and the spinal cord is normal.

The meninges are congested, the stomach normal, liver large and icterous, spleen contracted and hard, the bowels show broad streaks of pigmentation in serous coat, but no congestion. This is not constant. The peripheral blood vessels of cerebellum and pons are congested, the arachnoid space filled with superabundance of fluid, the pia mater highly congested, the cerebrum shows a circumscribed area, at the Rolandic fissue, usually about one inch in diameter. This little lake as it were, is perhaps half filled with a fluid and there is debris floating in it; usually this disintegration is found on one side of the lobe only and close of the septum lucidum. We find a great congestion of the choroid plexus and a small quantity of a dirty hemorrhagic mess which is constant in the taenia semicircularis. Perhaps at this point is where we find most of the hemorrhagic infarcts.

Bacteriologic and Pathologic Findings

In animals recently dead of the disease, I have found in the cerebro-spinal fluid a diplococcus associated with species of the trypanosome of the agglamation form. The diplococci are very numerous while the trypanosome is very scarce and difficult to find and does not take stain very readily until counter stained. The technic for staining is: take from a week-old pure culture that has been grown on a special media of defibrinated horse's blood and chicken broth and agar rendered alkaline, make the smear very thin and air dry, then take first carbolfuchsin and heat over a flame until steam begins to raise, pour off the liquid, then wash very quickly with seventy-percent alcohol and air dry again, then counter stain with eosin for twenty minutes and wash with distilled water, dry and mount in Canada balsam, examine with the one-twelfth, oil emersion lens. The diplococcus will be seen as white on a faint pink background, while the trypanosome will be seen as a deeper pink or red with its long flagellum and centrosome and nuclei. It will be seen as a round body about ten microns in diameter while the undulating flagellum is about twenty microns long. Then again you may find on the slide, but in a different field, trypanosomes undergoing a change that may not have any flagelli. This may be, and perhaps is, one stage in the life cycle of the trypanosome similar to that of the hemosporidium described by Ruge as follows: The youngest parasites are seen in the erythrocytes of birds as a small, round, refractive, sharply defined body with one minute pigment granule. The young protosoma are generally situated near one pole of the corpuscle, or it may be near its nucleus.

I am inclined to believe that the meningococcus or diplococcus that is so often found in the cerebrospinal fluid in this disease is commensal to the trypanosome above mentioned, and that many times they form rosettes that produce embolism and when in peripheral vessels these emboli form infarcts.

Etiology

I believe the so-called "Kansas Horse Plague" to be a disease of the central nervous system affecting horses, mules and cattle, and I may say as a conjecture only, that it may also affect man, and that it may be akin to pellagra in man; at any rate, pellagra is beginning to appear in some of the scourge-stricken districts in Kentucky, where we have two thousand cases already. We will watch to see if any other states

will experience any outbreak of pellegra, or any disease affecting the human family that has its origin in the central nervous system. My prediction is that such will be the case.

I am constrained to believe that this scourge has been brought to the middle west by the rusty black bird. I have recently found the trypanosome swarming in the blood of this bird, and again I am constrained to believe from my investigations, that we now have in this country a mosquito very similar to the anopheles maculipennis, which likely plays a part in the role of producing the malady. Though there is a difference in the habit of the two mosquitoes, while the anopheles nearly always seek low, warm, marshy, places. This new species has no preference for swamps, but will be found swarming around the roost of the black bird, and can be seen in the day time as well as at night, especially about an hour before sunset they will be seen in small groups; they may be seen a few feet from the ground. Their body is darker in color and thicker than the anopheles maculipennis. In their body their thorax and midgut and proboscis are very similar. They have only one set of wings, which are carried straight out from the body and are inclined to have a spot of darker color than the other part of the wing. They fly very slowly.

It is a noted fact that the black birds have a regular roosting place when they migrate to this country in the spring until they mate, when they seem to separate only to again congregate in the late summer after their brood has been developed, and it is noted that they will congregate in the trees in small towns and near electric lights. There must be a cause for this. This was not the case some years ago, but this condition becomes more observable each succeeding year. It may be that the mosquitoes molest the birds less in the electric light. Black birds are very plentiful in this country; they have multiplied very fast, or it may be that since electric lights around which they congregate have become plentiful we notice them more. Moreover, we are told by good authority that birds are refractory to the trypanosomes, but when their blood is swarming with the trypanosomes and a mosquito draws this infected blood from the bird, the parasite will remain in the stomach of the mosquito for a few days when a pupa is formed and this pupa is deposited on blades of vegetation, only to be taken up by a suitable host, a vertebrate. May not this be the fact relative to the new "horse plague"? But some of the scientists tell us there are many different species of birds that harbor the trypanosome of different species, but that they are not pathogenic, while other of the scientists claim that they may be pathogenic, while still others claim that perhaps many of them are pathogenic.

Therefore, I do not believe it right for any one to deny the charge that I have brought against the rusty black bird and the mosquito as being responsible for the late horse scourge. Yet it may not appear as fair for me to make the accusation until I have verified my theory. Yet I have evolved this idea and have been working along these lines with constant results that will bear me out in every detail.

Now as to the probability of its being akin to pellagra in man. It is claimed that pellagra is a spring and fall disease; that it comes and goes. So does the "horse plague." It is further noted that pellagra is a brain disease; that most of the pellagrans end in the asylums and usually are sent there before they manifest any skin lesions. After a patient is in the asylum a few weeks they begin to develop pellagra. Begin to show on the dorsum of both hands, at the nerve endings, also around the neck at the nerve endings.

You will remember that I have told you about the skin lesions in horses that recover from the new "horse plague," and especially of grey horses that show lesions at the nerve endings, particularly the depigmentations in the skin of grey horses. Suppose we try and see if a lesson may not be learned from these manifestations. We are told by histology, and anatomy and physiology, that in the cerebrum we have suitable places for the trypanosome. We have pigmented granules in Clark's Column, also in the gelatinous substance of Rolando. Suppose we find a hemorrhagic infarct near the

Rolandic fissure and producing a congestion to such an extent that a circumscribed area and all of the brain cells in that area are divested of their perineurium? Will not the consequence be a brain lesion just as we meet in this disease, and a liberation of the pigmented granules out in the neuroplasm and on to the nerve ending and cause the dark liver-colored spots on the hands and around the neck of pellagrans.

Histology tells us that the perineurium in the horse is a very thin delicate hyaloid membrane, and that in man it is very much thicker; therefore, in man the perineurium will resist more pressure and will withstand a siege of congestion for a longer period. Therefore, we may have this disease to show a chronicity early in its manifestation and the patient in the beginning to show some brain trouble several weeks before he is sent to the asylum, only to manifest pellagra in a short time, while in a horse nearly all manifest the disease in an acute or sub-acute form, but mostly of the acute type. It may be said that like the human family, some horses are provided with a very thick perineurium. These few exceptions will usually show the chronicity and recover and later manifest the skin lesion before mentioned.

The sum total of my theory is that the new "horse disease" and pellagra in man is caused by the trypanosome of the agglametion type, producing rosettes in cerebrum in both animal and man and that the port of entrance is by ingestion of the pupa, and that the entrance has been facilitated very much be the Strongylus armatus. As for the port of entry in the human, I withhold my opinion for the present.

The Strongylogenic Theory of the Horse Plague

Dr. Burton R. Rogers
VETERINARIAN

THE author of the article presenting the strongylogenic embolism theory of the "Horse Plague" of 1912 has pursued the investigation since writing his article in our December, 1912, issue and has ascertained from the infested territory that during the winter and early part of the year 1912 and last spring, that many of the farmers found it unusually hard and almost impossible to keep their horses in good physical condition, in spite of good food and care, and plenty of it. They remained poor, thin and emaciated.

If this was generally true, it must be considered as very strong circumstantial evidence of the presence of an unusually large number of blood-sucking intestinal parasites. Their appetites were voracious, too. If the parasites were responsible for the plague, there was in this a forewarning of which advantage could have been taken.

This evidence of hordes of intestinal parasites meant greater hordes of eggs and larvæ of the next generation, during the following summer and fall.

Another point, there is probably no other large section or area as that including western Kansas, Nebraska and Oklahoma, where the soil, climatic and other conditions repeat themselves so identically nor where there is such a uniformity in the kind of farming indulged in. Wheat farming means that threshing time is done within certain limits, and then for a period the horses are allowed to go to the pastures because there is no work for them to do.

This combination of three would be hard to beat for the perpetuation of an animal parasite.

First: In the winter and spring of 1912, horses heavily infested with adult parasites.

Second: Horses idle after harvest and turned into pastures.

Third: Unusually heavy rains, nearly three inches in August.

Fourth: Exceedingly hot weather, without wind, immediately following the rain.

More condition powders were sold in western Kansas in winter and spring of 1912 than ever before, thus showing the animals were not doing well.

White Diarrhea in Chicks

By B. F. KAUPP, M. S., D. V. S., Spartanburg, South Carolina
Commissioner of Public Health, Bacteriologist and Pathologist, Board of Health

EDITOR'S NOTE.—Every housewife knows that the high cost of eggs contributes an appreciable part to the high cost of living, about which we hear so much. But few know that the output of the poultry industry is enormously curtailed by disease, and thus its cost increased to the producer and the consumer alike, without benefit to anyone from this increased cost. This loss from disease is a total loss, and is distributed among the producers, middlemen and consumers alike. Of all the diseases of poultry, white diarrhea causes the greatest loss. It is a disease that is easily preventable, and, with certain limitations, easily curable. Every veterinarian should do his part, and the part of every veterinarian is a large one, to lessen the loss from this disease. In so doing he will not only increase his own profits, but serve well his community and the public in general. Next month Doctor Kaupp will discuss other diseases of the intestinal tract.

THE loss to American poultry raisers from white diarrhea is greater than from anything else, perhaps greater than from all other infectious diseases combined. It strikes at the root of the poultry industry; no one can successfully conduct the business if he is unable to rear a reasonable number of chicks annually.

Without treatment the resulting mortality, when white diarrhea has secured a foothold in a poultry plant, is extremely high. Often reaching ninety percent of the season's hatch. The loss from white diarrhea in dollars and cents is enormous, almost beyond calculation. It is widespread throughout the United States and causes the loss of perhaps ten percent of all the chicks hatched in this country. By proper measures the disease is fairly easily preventable and my experiments indicate that a large number of the chicks afflicted with this disease will recover under proper treatment.

Causes.—There are two forms of white diarrhea, due to two distinct causes. A bacillary form due to the *Bacterium pullorum*, a rather short, plump, rod-shaped germ with rounded ends; and a protozoal form due to the *Coccidium tenellum*. I have isolated the germ causing the disease from the liver, spleen, kidneys and other organs of chicks dead of the bacillary form of the disease, and in the coccidian form from the ulcers of the cecum and the intestines.

Symptoms: Bacillary Form in Young Chicks.—Drooping wings, ruffled feathers, sleepy appearance, huddled together, little or no appetite, abdominal yolk not properly absorbing; whitish or whitish-brown frothy discharge from bowel which adheres more or less to the vent fluff; eyes closed part of the time and apparently no interest in life. "Peeping" much of the time, the appearance in many is stilty, abdomen prominent behind. In these cases after death one finds the yolk unabsorbed or only partially so. The intestines are more or less full. Late fall, winter or early spring hatched chicks are freer from the disease than summer hatched. This may be explained by the fact that hens with diseased ovaries gradually become poorer layers as the disease processes advance, and hence, only lay in late spring or early summer when nature intends reproduction of birds. Finally the hen may cease laying.

Coccidian Form.—The symptoms as I have seen them are similar to those of the bacillary form, excepting, as a rule, the heavy death rate takes place later.

Mode of Spread: Bacillary Form.—Ovaries of laying hens, diseased, but still functionating, may be infected by the germ. The germ can be isolated, particularly from the yolk, of at least some of the eggs formed in such an ovary. The chicks from infected eggs, as a result, have the disease more or less developed when they are hatched, as conditions which favor hatching also favor

the multiplication of the germs to an extent that toxins (poisons) have already been produced, in the young in sufficient quantity for the disease to at least manifest itself in a few hours after hatching. The whitish, frothy, pasty bowel discharge, more or less sticky and having a tendency to "paste up the vent," from these chicks are laden with the germ, and others of the flock soon become infected from contaminated food picked up from the ground. In the former case chicks may begin to die soon after hatching, in the latter in from three to four days, a few dying each day. The death rate is high, reaching in many cases as much as seventy-five percent or more. Those that recover are stunted and do not make satisfactory growth. The greatest loss is from the first few days to, in some cases, two or three weeks. It is probable that the carriers are chicks that have recovered, but which have established immunity, and still carry the organism (especially in the ovary) as the human typhoid carriers carry the germs of typhoid fever, in the infected kidneys and in bowel ulcers. These "carriers" having established an immunity do not themselves succumb to the disease, and they rarely show any outward symptoms of it.

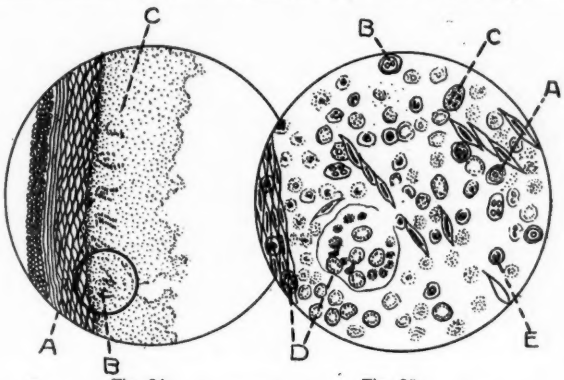

Fig. 34 Fig. 35

FIG. 34. SECTION THROUGH THE CECUM (MAGNIFIED 100 TIMES)
From a chick that had died of coccidian white diarrhea. A, Muscular layer. B, Remnant of gland. C, Degenerated disentegrating mass. There is complete destruction of the mucous membrane

FIG. 35. SECTION "B" IN FIG. 34 MAGNIFIED 900 TIMES
Shows various stages of the Coccidium tenellum. A, Oocyst. B, Sporoblast, first stage. C, Sporozoit, first stage. D, Schizont, merozoites within, surrounded by a disentegrating cell mass. E, Polymorphonuclear leukocyte

Coccidian Form.—The mode of spread of this form is at present problematical. It is possible that a chronic type of coccidiosis occurs in some birds and thus perpetuates and scatters the protozoa.

Postmortem Findings: BACILLARY FORM.—The liver in general, is usually pale, showing areas of congestion (active and passive congestion and cloudy swelling). The yolk only partially absorbed, congestion of the intestines may or may not be present. Kidneys normal in size but show congestion and cloudy swelling. Carcass more or less pale and emaciated and anemic.

COCCIDIAN FORM.—Upon postmortem examination the conditions are found to be similar to those in the bacillary form except, there will be noted, more or less congestion of the intestinal mucosa (lining), and ulcers in the intestines, principally the ceca. The ceca appear to contain considerable ingesta, and to be interfered with functionally. Fig. 34 shows a transverse section through an ulcerated area. In these areas we find cloudy swelling followed by necrosis (retrogressive changes and death of the cells). The remains of the dead cells forms a cheesy mass (caseation necrosis). It will be noted in this drawing that only remnants of a few of the glands normally present are yet intact, the remainder of the mucous membrane and in places the submucous layers are invaded by the germ (protozoon). In Fig. 35 the section B has been magnified 900 times.

As explained under the cut, all stages of the coccidium tenellum are observed in a mass of dying and disintegrating cells—the remains of the diseased mucous lining of the bowel. Repeated examinations have been made of healthy chicks killed for the purpose, and chicks dying from other causes, and thus far no case has shown these conditions.

Treatment. — Unsanitary conditions, spoiled feed, dirty stagnant water, improperly ventilated incubators, brooders and building, or badly regulated heat, are factors in weakening the physical condition of chicks and favor ravages of diseases.

The most of our experimental work with various remedies have been with the coccidian form. In one outbreak referred to above, 80 percent of the first hatch of 2000 chicks had died. We began trying to improve sanitary conditions, and administered various dilutions of permanganate of potash, copperas and carbolic acid. The loss was unaffected. By this time the

writer had examined many dozen birds in his laboratory and in about 50 percent of the cases the Bacterium pullorum was isolated from the heart blood, liver, spleen and kidneys, and in every case the coccidian ulcers described above were observed.

These chicks began dying in numbers at about ten days of age, very few had died before that time, and from this period to the end of the third week the great loss occurred. After this time but few died, but those having the disease in light form, were stunted and did not make satisfactory growth. With this data now before me I now began on another line of treatment.

During the past ten years I have used, to a greater or less extent, dilutions of mercuric chloride (corrosive sublimate) as an intestinal antiseptic in chickens. This was used, in this outbreak, in a solution of 1 : 10,000, with sulphocarbolates of zinc, sodium and calcium. The latter had not given the satisfactory results when used alone that it had in treatment of diarrhea in colts and calves.

Jones (Cornell) has shown that a solution of 1 : 1000 (one-tenth of one percent) bichloride of mercury will kill the B. pullorium in thirty seconds; a one-percent carbolic acid solution requires five minutes in which to kill this germ; one-percent creolin requires five minutes; three and one-third percent lactic acid kills it in five minutes, and five-percent carbolic acid kills it in thirty seconds. Mercuric chloride is therefore fifty times as effective against this germ as is carbolic acid.

Instructions were given for the incubators (containing also the nursery trays) to be tightly closed and fumigated with formaldehyde gas as recommended under chicken cholera, before filling with eggs.

After the chicks were hatched they were not to receive any feed for forty-eight to seventy-two hours, as the yolk contained in their abdominal cavity will furnish food for that length of time, and an engorgement of the intestines might impinge on this part and interfere with its absorption by pressing on the absorbing vessels. The following dilution was to be kept before them from the time of hatching to four weeks of age, and then given twice a week for the next few weeks: zinc sulphocarbolate, fifteen grains, sodium and calcium sulphocarbolate, of each seven and one-half grains, bichloride of mercury six grains, and citric acid three grains. This quantity was dissolved in a gallon of water. The result was that eighty percent of the next hatch was saved by this treatment.

LAMENESS—PARASITICIDES

I would like to know through your journal if obscure lamenesses in hind limbs of mules, where there is no indication of location through the usual methods, are invariably to be located in coxo-femoral joint. Also, has someone an effective treatment for weak, puny colts, affected with the various intestinal parasites, where a purge will only hasten the death of the animal?

Chicago Heights, Ill. L. N. PETERSON.

1. No, usually in the tarsal joint.
2. Give them Fowler's Solution.

The E. C. Norman-Bennett Kennels of Detroit, Michigan, have been moved from the city to a nearby country place for the summer, and the many high-class Bull Terriers will have the benefit of fresh air and exercise during their summer months. Veterinarians visiting Detroit will find a visit to the E. C. Norman-Bennett Kennels full of interest for them.

June 30th and July 1st and 2nd have been selected as the dates for the midsummer meeting of the Missouri Valley Veterinary Association. The summer meetings of this Association are increasing in popularity year by year. The attendance at this meeting is bound to be good, and the program will be worth hearing. Dr. Hal C. Simpson, Denison, Iowa, is Secretary.

The Hawkeye Veterinary Medical Association will meet at the Kirkwood Hotel in Des Moines, Iowa, June 26-27. Banquet will be held the evening of June 26th.

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The Doctor's Drugs

DR. P. A. FISH of Cornell University has been conducting a very interesting investigation, to ascertain the drugs most used by the veterinarians of New York.

He prepared a list containing 104 drugs, intended to be fairly representative, and mailed it to over eleven hundred veterinarians in New York state, with the request that they check the drugs in the list which they commonly used. Each veterinarian was also asked to supply an additional list containing his five favorite or most used remedies.

The replies to this inquiry are given in the *Cornell Veterinarian*, in part as follows:

"The first ten in the list of the more commonly used drugs with the number of veterinarians checking them follows:

"Nux vomica, 231; aloes, 204; Epsom salt, 161; potassium nitrate, 158; belladonna, 150; chloral, 148; arecoline hydrobromide, 140; linseed oil, 132; aromatic spirits ammonia, 124; cannabis indica, 123. Bacterins came twentieth in the list and was checked by ninety veterinarians.

"In the special list of five indispensable or favorite drugs, it was found that aloes, including aloin, was designated as first choice; nux vomica, including strychnine, as second; aconite, including aconitine, third; arecoline hydrobromide, fourth; chloral and opium, including morphine, received each the same number of votes for fifth place. Nux vomica headed the list in the four remaining groups. A comparison of the first five drugs in the five groups showed that aloes and nux vomica appeared in all five; chloral in four; arecoline hydrobromide in three; aconite, opium, belladonna and cannabis indica in two, and quinine in one.

"Disregarding the order of choice and taking the totals of the first five drugs in the five groups independently of the groups in which they appeared, it was found that nux vomica including strychnine was chosen by 208 veterinarians; aloes, including aloin, by 174; aconite, including aconitine, by 112; chloral by 92; arecoline hydrobromide by 84. Taking the five groups as a whole nux vomica leads with aloes a fairly good second.

"A total of eighty-one was included in the five groups of indispensable drugs. It is interesting to note that one of the five drugs chosen, arecoline hydrobromide, is not official.

"To the inquiry as to the use of an automobile in practice, one hundred and

eighty-five responded in the negative and one hundred and eighteen (including one motorcycle) in the affirmative, while twenty-five of the lists remained blank on this point."

AN EXPLANATION

Through one of those inexplicable errors which sometimes happen in the printing business, and always when least expected, the legends that should have accompanied the illustrations in Doctor Hadley's article last month were omitted. We reproduce them here and urge all to reread the article in connection with these explanations.

The article is one that deserves several readings anyhow, being a carefully prepared one, on an important subject that is brought to the attention of all practicing veterinarians with more or less frequency.

SOME NEEDS OF THE A. V. M. A.

The American Veterinary Medical Association needs a change in its fundamental law to provide for:

A permanent headquarters, with an office always open during business hours.

A secretary who will devote all his time and effort to the affairs of the association.

Fig. 2

Left stifle joint of Case 1; Sagittal section passing through inner ridge of trochlea of femur.
1, Anterior crucial ligament; 2, posterior crucial ligament; 3, thickened synovial membrane; 4, free joint bodies; 5, popliteal vein; 6, epiphyseal line; 7, middle ligament of patella; 8, upper end of femoro-patellar joint cavity; 9, lower end of same; 10, femoro-tibial joint cavity; 11, masses of fat. (Section does not show meniscus, being cut practically centrally through joint.)

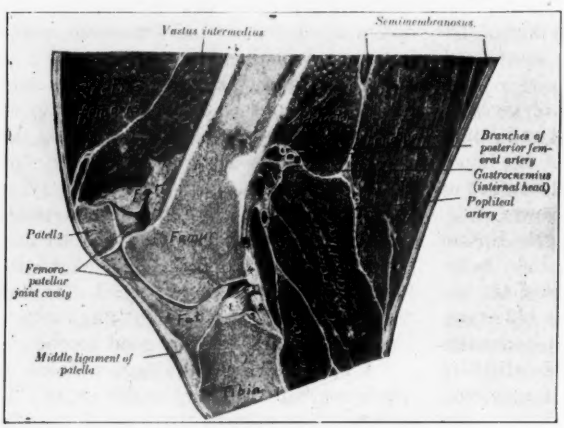

Fig. 1

Normal right stifle joint of horse; Sagittal section passing through outer part of inner ridge of trochlea and intercondyloid fossa.
1, Anterior crucial ligament; 2, posterior crucial ligament; 3, posterior cornu of internal semilunar cartilage; 4, femoral ligament of external semilunar cartilage; 5, articular artery; 6, part of vastus internus. (After Sisson's Veterinary Anatomy.)

Selection of a secretary for a term of not less than five years.

Election of a president a year in advance of the date of his assumption of the duties of that office.

A governing board who can be assembled, at small expense to the association, at least four times a year.

A more business-like supervision of the work of institutions who are qualifying men for membership in the A. V. M. A.

A greater cooperation with state veterinary examining boards and state livestock commissions.

A closer relation between the A. V. M. A. and state veterinary medical associations.

Concerted effort to secure adequate municipal meat and milk inspection in all considerable cities and towns.

Concerted effort to secure suitable animal quarantine regulations under county control and notification of animal deaths from infectious diseases.

Concerted effort to improve the legal requirements for practice in the various states.

In short, a readjustment that will permit the association to *do* something as well as *say* something, a change that will permit the association to perform needed acts for the benefit of the whole profession as well as to point them out as desirable.

A REDUCTION TEST OF THE QUALITY OF MILK

A study of the quantitative reduction of methylene blue by bacteria found in milk and the use of this stain in determining the keeping quality of milk, E. B. Fred (Centbl. Bakt. Parasitnk. 2, Abt., 1912, Vol. 35, No. 17–19, pp. 391–428).—The results of all the experiments dealing with stain reduction may be thus summarized: Methylene blue was found to be the most useful stain for measuring reduction by microorganisms.

While it is evident the reduction is a general property of all bacteria, this power is possessed to a varying degree. The milk flora, however, shows a strong reducing power. Out of twenty-two species of microorganisms generally prevalent in milk, twenty-one proved to be stain reducers.

Methylene blue is decolorized more rapidly in milk than in bouillon.

Temperature and stain reduction are inversely proportional up to 37° C. An increase of temperature causes a decrease in time of reduction.

Reduction in a newly inoculated culture medium is directly proportional to the growth of the bacteria.

The quantitative reduction of methylene blue varies with the different types of bacteria; however, each species seems to have a definite reducing coefficient.

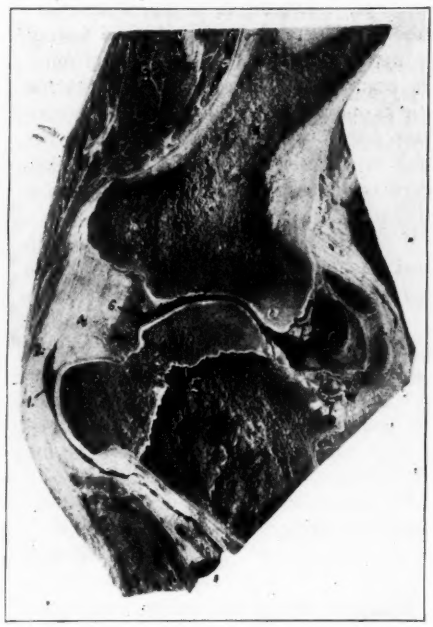

Fig. 3

Left shoulder joint of Case II; Sagittal section passing through intermediate ridge which subdivides the bicipital groove. 1, Bicipital bursa (bursa intertubercularis); 2, tendon of biceps; 3, supraspinatus; 4, pad of fat between joint capsule and bicipital bursa; 5, epiphyseal line; 6, distended joint capsule; 7, exostoses; 8, eroded articular cartilages.

The growth and reduction curves for all species have the same general form. This confirms the theory that reduction and bacterial development are parallel.

The ferment peroxidase is present in milk when secreted and is not formed to any great degree by the growth of bacteria.

Catalase is formed to a great degree by the development of microorganisms in milk.

The reduction of Schardinger's reagent is due to an enzyme known as "aldehyd-catalase."

Reductases are formed by the growth of microorganisms and do not occur in milk when first drawn. The reduction of methylene blue, free of formalin, is very complex, and is no doubt aided by the changes of matter during assimilation. Very probably both intracellular and extracellular products take part in the reduction.

The reduction test when used to measure the bacterial content of milk shows wide

variation; however, it is useful and furnishes a quick and easy method of testing the approximate bacterial content of milk. For example, milk that reduces methylene blue in one to one-fourth hours or less contains fifteen to fifty million bacteria per cubic centimeter. A sample that requires seven or more hours contains less than a million.

If colorless in three hours or less, milk must be considered of poor quality; more than three up to seven hours, of fair quality; seven hours and longer, good quality.

This test, in contrast to bacterial counts, does not cost much, and because of the ease and rapidity with which it can be carried out, could be used for hundreds of samples of milk where plate counts would be impossible.

The reduction test is of practical importance in judging the quality of milk.

L. W. F.

BOOK REVIEWS

Ophthalmology for Veterinarians. By Walter N. Sharp, M. D., Professor of Ophthalmology in the Indiana Veterinary College. Here is a work with which you will be delighted. It will be found most useful to every practicing veterinarian and veterinary student. It is new and covers well, a much neglected but important field of veterinary practice. The treatise is clear, concise and always to the point, giving first the anatomy of the eye, then the method of examination, followed by the discussion of various diseases, including injuries, parasites, errors in refraction, and medicines used in ophthalmic therapeutics. The text is well illustrated, and surgery of the eye is given adequate attention. No veterinary library is complete without it. 12mo of 210 pages, illustrated. Cloth, $2.00 net. W. B. Saunders Company, Philadelphia and London.

The Modern Gasoline Automobile, Its Construction, Operation, Maintenance and Repair.—By Victor W. Page, M. E. The use of automobiles by veterinarians is so general that a work of this kind has become as necessary as treatises on the diseases of the horse, which has been so largely replaced by automobiles. This book is written in simple language by a recognized authority, familiar with every branch of the automobile industry. It is free from technical terms, and everything is explained so simply that any one of average intelligence may gain a comprehensive knowledge of the gasoline automobile from it.

The information is up to date and includes, in addition to an exposition of principles of construction and description of all types of automobiles and their parts, valuable money-saving hints on the care and operation of motor cars propelled by internal combustion engines.

Motorists need this work because it is complete, authoritative and thoroughly up to date. Other works dealing with automobile construction published in the past, make no reference to modern improvements because of their recent development. All are fully discussed and illustrated in this volume. It contains special chapters on: I. Types of Modern Automobiles. II. How Power is Generated. III. Principal Parts of Gasoline Engines, Their Design, Construction, and Application. IV. Constructional Details of Pistons. V. Liquid Fuels Used and Methods of Vaporizing to Obtain Explosive Gas. VI. Automobile Power-Plant Ignition Systems Outlined. VII. Reasons of Lubrication of Mechanism. VIII. Utility of Clutches and Gearsets. IX. The Chassis and Its Parts. X. Wheels, Rims and Tires. XI. Motor Car Equipment and Accessories. XII. Operating Advice and Explanation of Automobile Control Methods. XIII. Hints to Assist in Locating Power-Plant Troubles. XIV. Keeping Up the Motor-Car Chassis.

By a careful study of this work the automobile owner can gain practical knowledge of his car and save himself money and worry. The book tells just what to do and when to do it, and no part in connection with the automobile, its care or repair seems to have been overlooked. Intending purchasers of cars will find this book a valuable guide. 500 illustrations, over 700 pages, 10 large folding plates. Cloth bound, price $2.50, prepaid. May be ob-

tained through the book department of VETERINARY MEDICINE.

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The Taint. By Henry B. Hollen, Ph. G. M. D. This is not a veterinary or a medical book, but is one popularly written for the instruction of the laity as to the dangers of venereal disease and its prevention.

The conditions which the author hopes this work will aid in mending are graphically told in the following from a recent issue of *The Journal of the American Medical Association:*

"Syphilis and gonorrhea undoubtedly surpass in prevalence all other infectious diseases combined, and their immediate and disabling effects fall most heavily on the most active and productive period of life. Morrow lays to gonococcus infection alone 80 percent of all deaths from inflammatory diseases peculiar to women, 75 percent of all special operations on women, and over 60 percent of all the work done by gynecologists; 50 percent or more of these infected women are left irremediably sterile, besides the number whose offspring are still-born, premature, weakly, diseased, or mentally defective. These figures may be too high, but probably not.

"Considering the terrible ravages of these diseases and their wide prevalence, preventive and prophylactic measures have been wofully inadequate. The community and state assume immense burdens in the care of victims of such conditions as deaf-mutism, mental defectiveness, tabes, general paralysis, blindness and many others. Yet the prevention of a large percentage of these conditions by prevention of syphilis and gonorrhea receives but meagre attention. If bubonic plague had but a fractional percentage of the incidence of these diseases, all hands would be joined to drive it out. Cholera in a civilized country today is no such social and national disease as venereal disease. We appropriate great sums to fight certain epidemic diseases and to maintain a rigid quarantine against them, but we are only now beginning to wage prophylactic warfare against diseases which are as dangerous as any epidemic disease and far more dangerous than many."

Of "The Taint" *The American Journal of Clinical Medicine* says:

"In telling 'the truth and the whole truth' the author has discussed both the prostitute as a source of disease and the numerous accidental ways of contracting extragenital syphilis. Two of the most interesting chapters are those concerned with methods of prophylaxis of venereal disease both in the male and the female. All ordinary methods of prevention are described, including those employed in the United States Army and Navy.

"The little volume contains a large fund of valuable information, collected from many sources and may well be placed in the hands of proper persons."

RECENT PUBLICATIONS

University of Pennsylvania Announcement, School of Veterinary Science, for the 29th Annual Session. This announcement gives a list of the faculty and instructors and an outline of the course of study, with a list of the students and their home addresses.

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Views, University of Pennsylvania, School of Veterinary Medicine. This pamphlet of thirty pages gives thirty-six half-tone illustrations of the college and various class rooms and laboratories and also a summary of the medical and surgical clinics held during the past year, with a table showing the results of the postmortem examinations held at the college during the year.

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New York State Veterinary College Announcement for 1913–'14. This announcement gives a list of the instructors, an outline of the course of study and a list of the present students in the institution with their home addresses.

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The Action of Arsenical Dips in Protecting Cattle from Infestation with Ticks, Bureau of Animal Industry, Bulletin No. 167, by H. W. Graybill, Assistant Zoologist, Zoological Division. This bulletin gives the composition of various arsenical and other dips, and an account of

several experiments to test the efficiency of each.

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Preparation of Concentrated Lime-Sulphur Solution, Virginia. Agricultural Experiment Station, Bulletin 201, Blacksburg, Virginia. This bulletin discusses the preparation of a concentrated (stock) lime-sulphur solution and the result of several experiments undertaken to determine the most practical concentration and the most economical form of lime to use.

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Bacteria Which Survive Pasteurization, Bureau of Animal Industry, Bulletin No. 161, by S. Henry Ayers, Bacteriologist, and William T. Johnson, Jr., Scientific Assistant, Dairy Division. This bulletin describes quite a large number of experiments undertaken to ascertain various important data regarding this subject. It is a bulletin that should be in the hands of all milk inspectors and others interested in knowing what may and what may not be accomplished by the pasteurization of milk.

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Agricultural and Industrial Statistics, Annual Report of the Louisiana Department of Agriculture, Baton Rouge. Among various papers and addresses given in this pamphlet is one of great interest by Dr. W. H. Dalrymple on "Southern Live Stock Possibilities," which deals among other things with horse and mule breeding in the South, tick eradication, control of infectious diseases, and the need of the South for immigrants.

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Avian Tuberculosis, Wisconsin Agricultural Experiment Station, Madison, Research Bulletin No. 28, by E. G. Hastings and J. G. Halpin. Under the direction of Professor Hastings Wisconsin has for several years carried on an investigation of tuberculosis among the domestic fowls of the state. This bulletin, after a review of the occurrence of tuberculosis among the birds in the zoological gardens and among the domestic fowl of other states, gives statistics that show that this disease is widespread and destructive in Wisconsin.

It was found that the tubercle bacilli are eliminated from infected birds chiefly in the dejecta; that infection takes place via the alimentary canal, and that the spread from bird to bird in an infected flock was slow.

Birds having tuberculosis of the ovary were found to lay eggs in which the bacillus occurred, and chickens hatched from these eggs died of tuberculosis after a period of two to several months. It is mainly through infected eggs that avian tuberculosis is spread among flocks. Non-progressive tuberculosis also occurred in rabbits and hogs from feeding avian tubercle bacilli.

A number of illustrations are given, showing diseased organs and birds.

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The Question of Tick Eradication, Department of Agriculture, Bulletin No. 6, by Peter F. Bahnsen, State Veterinarian, Atlanta, Georgia. This is an attractive bulletin of twenty-eight pages, designed to catch and hold the attention of the cattle raiser in the tick-infested district. The bulletin consists of a series of questions in red, and answers in black and white. Some of the statements appear to be somewhat overdrawn or exaggerated, but doubtless this is the result of "the natural clamor of self-interest," to use the author's own words in describing the claims of the manufacturers of the various dips.

The bulletin constitutes one of the strongest pleas yet made to the farmers of the South for the eradication of the fever tick.

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Analysis of Commercial Feeding Stuffs, 1912 Report of the Connecticut Agricultural Experiment Station, New Haven. This bulletin gives the analysis of the various proprietary and other feeds offered for sale in Connecticut.

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Commercial Feeding Stuffs, Bulletin 164, Vermont Agricultural Experiment Station, Burlington. This bulletin contains the analysis of a large number of proprietary stock foods and condimental feeds offered for sale in Vermont. It shows the proprietary stock foods to be,

as every veterinarian knows, practically without any of the medicinal value claimed for them by the manufacturers and expenditures for their purchase practically a total loss to the livestock owner.

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Live Stock Sanitary Control, an address by Dr. M. H. Reynolds, University of Minnesota and State Livestock Sanitary Board, at the Kansas Veterinary Medical Association, January 6–8, 1913. This address, which has been published in pamphlet form by the Kansas Veterinary Medical Association, Manhattan, gives in detail the plan for livestock sanitary control urged by Doctor Reynolds and adopted in part by the state of Minnesota. The plan is effective, and is advantageous alike to the veterinarian and to the livestock interests. It may well serve as a basis for the livestock legislation in other states.

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Agglutination Reactions in Hog Cholera During the Process of Serum Production, Technical Bulletin No. 8, by Ward Giltner, Division of Bacteriology and Hygiene, Michigan Agricultural Experiment Station, East Lansing, Michigan. This bulletin of forty pages contains the record of numerous experiments undertaken to determine the relative importance of the filterable virus, Bacillus choleræ suis and Bacterium septicæmiæ hemorrhagicæ in the production of swine epizootics and the importance of their consideration in the preparation of antihog-cholera serum.

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Antigen Responsible for the Anti-Bodies in Dorset-Niles Serum? *ibid.* This bulletin contains the record of a continuation of experiments described in the above. The conclusions are that the Bacillus choleræ suis produces a disease in hogs very closely simulating natural cholera, and that it is present in most and probably all cases of natural infection.

Pigs hyperimmunized by cultures of the Bacillus cholera suis mixed with pig blood free of the filterable virus showed a considerable immunity to the filterable virus.

Pigs hyperimmunized with pure cultures of Bacillus choleræ suis were given no protection against the filterable virus.

The Dorset-Niles serum was found to be more potent against the filtered virus than against the unfiltered virus.

The mixing of the Dorset-Niles serum and hog-cholera virus in vitro and incubating two and a half to three hours, does not seem to lessen the virulence of the virus. There is no indication that mixing the serum and virus in vitro has any advantage over the serum-simultaneous method of injecting these agents for immunizing pigs against hog cholera.

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Infectious Abortion and Sterility in Cattle, *ibid.* This bulletin describes briefly contagious abortion in cattle with the treatment by injection of cultures of lactic acid bacillus and attempts at immunization with a bacterin made from the Bacillus abortus.

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Hog Cholera Serum and Protection Against Hog Cholera, *ibid.* A brief description of methods for using antihog-cholera serum. The serum-simultaneous method is preferred.

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Tuberculosis in Fowls, *ibid.* A monograph on the subject, calling attention to the presence of tuberculosis among fowls and giving symptoms by which it may be diagnosed.

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Direction for Handling Lactic Cultures, *ibid.* This pamphlet is for the information of those using the lactic acid cultures, made at the Experiment Station, for making butter, cheese and artificial buttermilk. A brief discussion is given of the therapeutic value of lactic acid cultures and the reader is urged to form the buttermilk habit. A statement occurs that "the lactic acid culture or the Bulgarian culture, which is handled the same as the lactic culture, can be used to advantage in the preparation of artificial buttermilk." This statement is somewhat surprising, as it is generally taught that the Bulgarian bacillus can be grown only with difficulty and that the cultures need to be kept in an incubator at body temperature.

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Announcement, Division of Veteri-

nary Science, Michigan Agricultural College, East Lansing, Michigan. This announcement contains information regarding the matriculation requirements, course of study and graduation requirements of the Veterinary Department of the Michigan Agricultural College, of which Dr. R. P. Lyman is the head.

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United States Live Stock Sanitary Association.—Report of the Sixteenth Annual Meeting. By Prof. J. J. Ferguson, United Stock Yards, Chicago. This report of nearly two hundred pages contains the full proceedings of the annual meeting, held in Chicago, December 3, 4, 5, 1912. All papers read at the Association (except one), together with their discussions, are given in full, as is also the voluminous reports of the many standing committees of the Association.

The reports of the meetings of this Association constitute the best discussions obtainable of livestock sanitation for American veterinarians, and a copy of each report should be in the hands of every veterinarian in the country. It may be had from the Secretary. The price is $1.00.

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The Histology of the Oviduct of the Domestic Hen.—By Frank M. Surface, Maine Agricultural Experiment Station, Orona, Maine. This is a highly scientific paper of great value to those interested in the subject. It also contains a complete bibliography on the subject and five full-page plates.

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The Internal Use of Carbolic Acid for the Prevention of Contagious Abortion in Cattle.—By W. J. Taylor, Veterinarian, Montana Agricultural Experiment Station, Bozeman. This bulletin is noteworthy in that it revives the old and practically discarded practice of giving carbolic acid with the feed for the prevention of contagious abortion in cows. The record of a number of experiments is given, but until we possess more information as to the manner of spread and the period of incubation of contagious abortion, we are scarcely justified in saying that the apparently favorable results obtained in these experiments were due to the administration of carbolic acid, nor can we at all agree with the conclusions that "carbolic acid, whether fed in solution or injected hypodermically, seems to be a specific against contagious abortion."

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What Your Neighbor Says Concerning Anti-Hog Cholera Serum.—By the Veterinary Division of the South Carolina Agricultural College, Clemson, South Carolina. This is a brief description of the antihog-cholera-serum production in South Carolina and its distribution, with various letters in the form of testimonials from farmers, who have used it. These letters would indicate that hog cholera is widespread and severe in South Carolina and that the serum produced by the Veterinary Department of the Agricultural College, of which Dr. M. Ray Powers is the head, is successful in the prevention of hog cholera and of some curative value.

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Notes on Infectious Abortion in Cattle.—By Frank M. Surface, Kentucky Experiment Station, Lexington, Kentucky. Published in Science, N. S. Vol. XXXVI, No. 926, pages 409–412, September 27, 1912. The article consists quite largely of a review of available literature on the subject. Those interested may probably obtain a reprint from the author.

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Bovine Infectious Abortion, Epizootic Among Guinea-Pigs.—By Frank M. Surface, Kentucky Experiment Station, Lexington, Kentucky, published in the *Journal of Infectious Diseases,* Vol. XI, No. 3, November 1912, pp. 464–467. Gives the details of extensive experiments of the author in diagnosis by the agglutination and complement fixation reactions.

It was discovered that guinea-pigs were readily infected with the Bacillus abortus and their reproduction very much lessened. On autopsy it was found that the average weight of the spleens of infected pigs was over four times that of noninfected.

The article is an interesting contribution to our knowledge of infectious abortion. Reprints may probably be had from the author.

WORLDS WORK in Veterinary Science
A digest of all the Current Literature of Comparative Medicine
By Dr L. W Fetzer Washington, D.C.

HOG CHOLERA. S. Lowensohn (Illust. Landwirtsch. Zeitung. 1913. Vol. 33. No. 3, pp. 14–16).—Vaccinations were made in a herd consisting of 1030 hogs, with Hutyra serum, Suptol-Burow, and a serum termed commercially as "Neu" (New). The best results were obtained from Hutyra serum.

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ABOUT a bacillus belonging to the paratyphoid B. enteritis group causing an epizootic of abortion in mares. de Jong (Zentralblatt. f. Bakt. Parasitenk. Orig. I, Abt. Vol. 67, No. 3, pp. 148–151).—An epizootic of abortion was noted amongst the mares located in the neighborhood of the North Brabant province (Holland). From all the organs and the fetal membranes (foals) a short ovoid bacillus in pure culture was isolated and which belonged to the paratyphoid B. enteritis group. This organism when fed to or injected intravenously into pregnant mares produced abortion. It was not possible to produce abortion by giving the culture intravaginally. From the aborted foal the culture could be reisolated.

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TREATMENT of a fibrosarcoma in a horse with a radium-barium-selenium-compound Staff Vet. Weinbold (Zeitschr. f. Veterinark. 1913, Vol. 25, No. 1, pp. 22–25).—A fibrosarcoma of four years' standing on the left hind leg of a sixteen-year-old horse in the military service was treated by injecting a new preparation, radium-barium selenate (Merck). The preparation was injected into the growth and intravenously. After treatment the animal was killed and an autopsy held on it which showed that the preparation was harmless and that the further growth of the tumor cells had been checked, etc.

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INJECTION of colloidal silver for strangles District Vet. Durst. (Münch. Tierärztl. Wochenschr. 1913, Vol. 57, No. 10, p. 205).—A tracheotomy was done in a horse strongly affected with strangles and as a result the animal was apparently cured. When the horse was hitched and put to work tremors and chills developed. Later the shoulder and knee joints, lower breast and abdomen became swollen. No petechia, such as occur in morbus maculosus, were present. An intravenous injection of colloidal silver and Credé ointment applied to the swollen areas. The second day following these applications, marked improvement was noted and the fever subsided and the appetite was regained.

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EXPERIMENTAL investigations in regard to the occurrence of latent tubercle bacilli in lymphatic glands. E. Joest, E. Emshoff and W. Semmler (Ztschr. Infektionskrank. u. Hyg. Haustiere, 1912, Vol. 12, No. 2, pp. 117–136).—Tubercle bacilli of the human type of medium virulence when given to guinea pigs in small amounts intramuscularly can be noted twenty-four hours after infection in the lymphatic glands of these animals. With the bovine type of organism this is possible only after five days' post infection. Both the bovine and human types of bacilli twenty-four to forty-eight hours after they are noted in the lymphatic tissue, produce noticeable pathological changes which manifest themselves as very small tubercles consisting of epithelioid cells. According to this the

period of incubation in the lymphatic tissues is in the neighborhood of twenty-four to forty-eight hours. Tubercle bacilli do not remain latent in the lymphatic glands.

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SOME further researches on Jöhné's disease. F. W. Twort and G. L. Y. Ingram (Vet. Rec. 1912, Vol. 25, No. 1262, pp. 141–143).—Continuing their work along these lines the authors prepared a vaccine from a nine-months-old culture of Jöhné's bacillus grown on ordinary glycerin peptone beef broth, containing a glycerin saline extract of *Bacillus phlei*, was tested on three full grown bovines and on five calves about seven months old. All of these animals were previously tested with ordinary diagnostic tuberculin with negative results. In the case of the adult bovines, each gave a positive temperature reaction within one to five hours, and the highest temperature obtained was 106.1° F., and the lowest 104.8°. Two of the animals developed a violent diarrhea.

The calves, six months before the testing of this vaccine, had been inoculated with living cultures of Jöhné's bacillus from the intestine of a calf in which we had produced the disease by the inoculation of a pure growth of bacilli. Of these five calves Nos. 1 and 2 were injected intravenously, Nos. 3 and 4 intraperitoneally, and No. 5 subcutaneously. Of the special vaccine, calves 2 and 3 received 3 Cc., and calves 1, 4 and 5 each 5 Cc. Calves 2 and 3 showed no rise of temperature in six hours; calf 1 rose to 104.6° F. in three hours; calf 4 rose to 105° F. in six hours; and calf 5 showed no rise in ten hours, but twenty-four hours after inoculation the temperature was 105.4° and slowly declined. Through an error the temperature of calves 2 and 3 were not taken after the sixth hour. A few days after these tests the five calves were killed and postmortem examination made with the following results:

Calf No. 1: Typical lesions of Jöhné's disease and bacilli in the intestines and mesenteric glands. No tuberculosis. Calf No. 2: Slight lesions of Jöhné's disease in intestines; several acid-fast bacilli in lesions; no tuberculosis. Calf No. 3: Typical tubercular bronchial glands; no Jöhné's disease. Calf No. 4: Typical tubercular bronchial glands, and Jöhné's disease in a moderately advanced stage, the bacilli very numerous near the ileocecal valve. Calf No. 5: Typical tubercular bronchial glands and tubercular lesion in the apex of the right lung; no microscopic evidence of Jöhné's disease, but a few bacilli found beneath the mucous membrane of the ileocecal valve, and several in a mesenteric gland. Cultures were made from beneath the mucous membrane of the intestine of all the cases, and the bacilli grew in all except calf No. 3.

After repeated subculturing, and after living about eighteen months outside the animal body, the bacillus was induced to grow on ordinary glycerin liver broth. The strain was then made to grow on ordinary glycerin beef broth.

Two goats were inoculated with living cultures of Jöhné's bacillus, and some months later tested with the vaccine described above. Both animals gave a typical reaction and on autopsy showed typical lesions of the disease and the presence of the bacilli which cause the disease.

In all probability the condition demonstrated in deer and sheep is identical to that found in bovines. The disease being thus demonstrable to an owner in its earliest stages, state legislation should be adopted making slaughter compulsory. No compensation would be called for, the carcass of an affected animal being salable, and it being to the interest of the owner to remove a source of infection from his herd and prevent its further spread.

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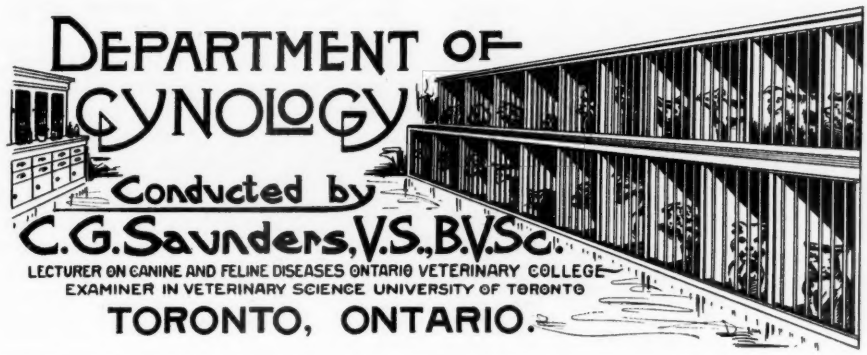
TRYPANOSOMES in sheep. Dr. Behn (Berlin. Tierärztl. Wochenschr. 1912. Vol. 28, No. 50, p. 934).—This author previously reported the finding of trypanosomes in a sheep. He now reports findings in three sheep. Two of the animals came from the same herd in which the previous finding was noted, but the third a half-year-old lamb, was born in the tropical laboratory of the Veterinary High School at Berlin and was the progeny of one of the two infected sheep.


DEPARTMENT OF
CYNOLOGY
Conducted by
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Bronchitis

PUBLISHER'S NOTE.—Lack of space compels us to omit the questions which have been sent in for this issue and their answers and also to hold over until next month a number of excellent case reports which we should have liked very much to publish at this time. Next month Doctor Saunders will take up the discussion of pneumonia in dogs. Watch for this article. It will be worth it.

THIS affection is quite common; it consists of a catarrhal inflammation of the bronchial mucous membrane and occurs both in the *acute* and *chronic* form, which see.

Acute Bronchitis

This ailment may be due to any of the following causes: infection; exposure to cold and wet draughts, when warm from exercise, or from lying in front of a stove or fire; smoke, chemical fumes, (inhalation bronchitis), medicines, going "the wrong way," particles of food inspired, when the animal is insensible, parasites, ether anesthesia, and as a complication of distemper.

The average duration of an attack of acute bronchitis is from two to three weeks.

Symptoms.—This disease is ushered in with shivering fits or rigors, and a rise of temperature to 103° F.—105° F. The animal is depressed and more or less indifferent to its surroundings; the bowels are costive; the urine highly colored and scanty; soon a cough appears, at first dry and dull, but later, as the disease reaches the second stage, moist and loose. The cough can be quite easily excited by pressure on the thoracic walls behind the shoulder or by slight pressure on the trachea. At first only the large bronchi may be affected, but if the condition extends to the capillary air passages, the above symptoms are much intensified. The respirations are quickened and labored, and the cheeks puff out at each expiration; the fever runs higher and the depression and general constitutional disturbance more marked. The pulse at first is full and bounding, becoming quicker and weaker, and in cases approaching a fatal termination almost imperceptible. Percussion gives negative results. Auscultation, in the first stage, reveals that the respiratory sounds are harsh and dry (bronchus rale); in the second stage, the mucous rale is well established, and the vascular murmur intensified. An attack lasts two to three weeks, and ends in recovery, chronic bronchitis, catarrhal pneumonia, stenosis or asthma.

Treatment.—In smooth-haired dogs the thorax should be covered with a coating of kalaplasma kaolini U. S. P. (or Antiphlogistine, Thermofuge, etc.), applied hot, and covered with a thick covering of cot-

ton wool, kept in place either by a bandage, or by a pneumonia jacket, which can be easily made from factory cotton quilted with cotton wool or batting. This application should be removed and reapplied, every twenty-four hours, for two dressings. In animals who are covered thickly with hair, oil of sinapis, one part, and olive oil, forty parts, well rubbed in, should be substituted

No Trespassing—From *Our Dumb Animals*

for the kataplasm, and the jacket applied as before.

A purgative is always indicated in acute bronchitis, and may consist of calomel, one-half to two grains, repeated as occasion requires. it being most important to stimulate elimination from the outset of the disease. Unless the disease is of the well-marked sthenic type and the fever is extreme, the coal-tar antipyretics, phenacetin, antipyrine, etc., should be sedulously avoided, on account of their depressing action on the heart. The fever may be kept within bounds and elimination obtained far better by febrifuges and diuretics. The cough may be regulated by one-fourth-grain doses of codeine sulphate every hour.

℞ Potassii acetatis.....grs. xv
Liquor ammonii acetatis....dr. i
Spiritus etheris nitrosi.....min. xxx
Infusion buchu.....drs. iv

M. Give four drams without water twice daily.

In the second stage an expectorant cough mixture should be given and stimulants as needed, of which there is none better than strychnine, gr. 1-200 to gr. 1-60. The following prescription may be used with good results.

℞ Heroin hydrochlor.....gr. i
Syrupi tolutani,
Syrupi scillæ, aa.....drs. vi
Aquæ chloroformi.....ozs. vi

M. Give two to four drams in water three times daily.

℞ Vini ipecacuanhae.....min. xii
Liquor ammonii acetatis,
Syrupi scillæ, aa.....dr. ss
Syrupi codeinæ.....min. xv
Aquæ ad.....drs. iv

M. Give four drams three times daily.

Should the bronchial tubes become loaded with mucus, of which they are not able to rid themselves, and the animal's breathing become greatly distressed because of its interference with the passage of air, an emetic, of which the most effective is one-thirtieth to one-tenth of a grain of apomorphine hydrochloride, will give great relief, often averting suffocation.

The after-treatment consists of a liberal diet and tonics, such as Blaud's pills, one, three times a day, or a granule composed of

℞ Strychnine arsenate.....gr. 1-128
Iron arsenate,
Quinine arsenate, aa.....gr. 1-64
Nuclein solution.....min. iv

M. Give one-half to three, three times daily, or

Give ferri et quininæ arsenas, two to ten grains three times daily.

Chronic Bronchitis

This is a sequel to cases of acute bronchitis, which owing to neglect or other reasons, merge into the chronic. It runs a varied course of from a few weeks to several months.

Symptoms.—Continual coughing and expectoration. The cough is easily started by exertion or excitement and the expectorated matter is tenacious, and often of an offensive odor. The pulse and temperature

as a rule are disturbed but little, although the latter may be slightly elevated in some cases. The animal's appetite is variable, and it generally loses flesh and becomes more or less emaciated.

Treatment.—The treatment consists in controlling the cough, and the exhibition of expectorants, and steaming with stimulating medicated inhalations and the administration of tonics.

In this condition "Guaialyptol," a combination of guaiacol, eucalyptus, camphor and phenic acid in oil, has a markedly beneficial effect upon the mucous membrane and disinfects the entire respiratory tract. Cod liver oil is also a most valuable reconstructive in addition and should be given a trial. A liberal diet must also be prescribed and as in all diseases of the organs of respiration the importance of proper hygienic conditions must not be lost sight of.

EXPERIENCE WITH CANINE DISTEMPER BACTERIN

Case 1.—Bull terrier pup, seven months old. Brought to the hospital on September 21, 1912. This dog was very much emaciated, as the disease had been running for several days. There was a profuse discharge from eyes and nose, a short, hacking cough, labored breathing, diarrhea with dejecta of a brownish color, no appetite, distemper pustules on lower portion of abdomen, inner part of thigh, on face and between the ears. I gave him sweetened milk and raw eggs as a diet.

On the 21st this case was given 175,000,000 killed bacteria (Bacillus bronchisepticus), also gave milk of magnesia, echinacea and nuclein in normal saline solution.

September 27, I gave him 350,000,000 killed Bacillus bronchisepticus. Some improvement was noticed at this time.

October 4th I gave 525,000,000 killed bacteria. He was very much improved at this time and more lively; the discharge from nose and eyes had ceased, there was no cough, the pustules had dried up, bowels were in good condition, and the appetite good.

Case was discharged October 5th, cured.

Case 2.—Spitz pup, eight months old. Was brought to the hospital on November 3, 1912, for treatment of the eyes. I suspected distemper, but aside from discharge from eyes no other symptoms of distemper were present. Gave dose of bacterin No. 1.

November 6th, had slight discharge from nose, very light cough, bowels normal, appetite fair, two pustules on abdomen. Gave dose No. 2.

November 9th, the dog was much improved and was discharged on November 13th.

Case 3.—Cocker spaniel, nine months old. This case was first seen December 6th. Had been sick nine days; was very emaciated and weak; with a profuse discharge from nose and eyes, severe cough, labored breathing, and no appetite. I gave him bacterin, dose No. 1, in conjunction with nuclein and echinacea.

December 9th, noticed slight improvement; gave bacterin No. 2.

December 12th, the dog was in very bad condition; gave bacterin No. 3. The dog died December 13th.

Case 4.—Pointer pup, seven months old. Was first seen December 29th. Discharge from nose and eyes, pustules on abdomen, appetite fair, bowels normal. Gave bacterin, dose No. 1. I saw the case again January 1, 1913, and gave bacterin No. 2. The dog much improved at this time. January 3rd, dog discharged.

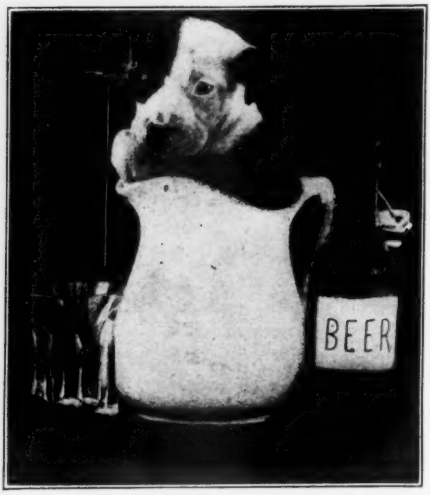
Case 5.—Two cocker spaniel pups. I first saw these dogs December 29th. One had a discharge from eyes and nose, the other had discharge from eyes only. Gave bacterin, dose No. 1. These dogs were fairly lively, not having had the disease long.

December 31st both had discharge from nose, cough and labored breathing, appetite fair. Gave bacterin No. 2. January 3rd I gave bacterin No. 3. The dogs much improved. January 4th they were discharged as cured.

Case 6.—From same litter as Case No. 5. This dog came to hospital December 24th. Very poor and weak, no appetite, had the disease some time, discharge from nose and eyes, cough, labored breathing, very

dejected in appearance. I gave bacterin No. 1 in conjunction with nuclein and echinacea and milk of magnesia.

December 27th there was no improvement, and I gave bacterin No. 2. December 30th, no improvement, gave dose No. 3. January 2nd, 1913, the dog began to take some nourishment, milk and raw lean beef. Gave bacterin No. 4. The patient had improved quite a little.



A little growler

January 7th, he had lost all appetite and became weaker. Gave bacterin No. 5. Discharge from nose and eyes was more profuse, more cough. January 10th, gave bacterin No. 6. Dog died that evening.

C. R. WALTER, D. V. S.

Tulsa, Okla.

DIPHTHERIA ANTITOXIN FOR "BLACK TONGUE"

Having had considerable experience with the so-called black tongue in dogs, and finally having been successful in treating it, I write briefly on the subject for the benefit of the veterinarians—especially of the southern states, where this disease is most prevalent.

The symptoms are lassitude, constipation, inability to eat or drink, saliva adheres to the sides of the mouth, and there is fever. Examination of the mouth discloses ulcers or pustules which are foul smelling and very red. The tongue, espepecially at its base, is swollen, as are the mucous membranes of the cheeks. These symptoms become more intensified as the disease progresses and at the expiration of from three to five days it is impossible for the animal to take nourishment.

Treatment.—Give 6000 units of diphtheria antitoxin (human) to a dog of forty pounds' weight, and repeat in four or six days if necessary. Also administer saline laxatives and apply antiseptic washes to the mouth and keep cool water always before the patient.

The cause of this disease is unknown. I advise the use of antitoxin first, then form your own conclusions as to the causative organism.

H. T. FARMER, D. V. S.

South Boston, Va.

TREATMENT OF FRACTURES IN THE DOG

Fracture of Radius.—What is the proper treatment in a case of simple fracture of the radius? In certain breeds of dogs, such as fox terriers, Airedales, and so on, a great deal of their value, and certainly one of their great show points, is straightness of limb. It is necessary for them to be perfectly straight from the point of the shoulder down to the wrist.

In a case where a dog has been bitten or damaged by being run over, and you have a simple fracture of the shaft of the radius, either in its middle or its upper third, my old practice in dealing with it was to put a bandage and splint on; leave it on for about three or four weeks; take it off, give the dog limited exercise, gradually increasing it daily, and the bones certainly mended very well. But I noticed that afterwards the dog lost its straightness of limb to a great extent, and there was a distinct dip at the seat of fracture. My idea was to overcome that if possible. In human beings, in a case of simple fracture of the radius, no surgeon would dream, so far as I am aware, of putting the limb into ordinary flat splints and bandages, and

putting it in a sling around the neck. I do know of a case where this was done, with exactly the same result that occurs in dog practice where you put splints and bandages on a dog's leg, that is to say, you get a dip at the seat of fracture.

To overcome that, in human practice they put on a splint to tilt the wrist downward, to give it a pull on the lower end, and they support the arm very little in order that the muscles of the upper arm, which are attached to the radius, may draw the end upwards, and so avoid the dip and get the two ends of the bone in proper apposition. The thumb is put around the splint and the fingers strapped down to it, or bandaged round by a piece going at right angles, in order to keep the arm in that position and rest the bone. Otherwise the two broken ends of the radius dip, come into apposition with the ulna, and a large callus is thrown out; and on movement or rotation of the arm you get the callus rubbing and making a false joint with the ulna.

In the case of a dog you cannot do that. A dog's wrist is straight; you cannot bend it to one side in order to raise the radius from off the ulna. Even if you did put his wrist and foot into that position it would not remain there long. As soon as the dog is left alone he will tear the bandage off and make his foot straight again. So that I have tried just letting it alone. I put a cold-water bandage on for the first day or so to reduce the pain and the swelling, and then give the dog limited accommodation, so that he can move very little; and after the first week I have given him very little movement. I just let him run about for two or three minutes in the morning, and two or three minutes in the afternoon; I gradually increase that, and at the end of three weeks the dog is putting his leg down and running pretty well; and at the end of four weeks you will not know that he has hurt his leg at all, except that when he walks very slowly and has to sustain weight on that leg he will fail just a little. Some dogs get better even quicker than that.

I take it that once the inflammatory condition has gone out of the leg, at the end of the seventh or eighth day you begin to get union—soft union certainly—and provided the movement between the end of the bone is not excessive during the second week, and well into the third, you may begin to get deposition of bone, and provided movement is not excessive there is no reason why you should get a false joint. Anyhow, the cases that I have had prove to me that one does not get a false joint.

I have three cases at the present moment which have had no treatment whatever, except limitation of movement and great care in handling to see that the dog is not too wild, because after a little confinement dogs get very boisterous, and if you are not careful they will knock the leg, bang it against corners or furniture, and so undo the good that has been done by the continued rest they have had. I could show you a dog that had a fractured radius twenty-two days ago that is now running about practically sound; you can only see any lameness on very slow movement. I showed the dog last Saturday to a judge of fox-terriers, and asked him which leg was broken. I held the legs straight out to him in front of me, but I did not let him touch them. He picked out the sound leg, but when he felt it and felt the callus, he expressed the opinion that the broken leg was much better to look at than the sound one. I was rather pleased to hear that, because it gives me some encouragement to proceed further with that treatment.

I have mentioned this plan before to other veterinary surgeons, and they have all said, "Yes, but what has the owner got to say about it? Will any owner tolerate your accepting the case and then doing nothing in the way of treatment?" My answer to that is very emphatic: If people cannot trust me sufficiently with my method of treatment they had better take their dog somewhere else, and I think that is the answer we should always give.

Other Fractures.—Following on simple fractures of the radius, there are other cases where, in my opinion, bandaging is of no use. Without taking up too much time, I would simply mention that I think it is positively criminal to put a bandage on a

broken femur of broken pelvis. Keep the dog as quiet as you can, and let him come back to his exercise very slowly. If you put a heavy bandage, or plaster, or splint on in a case of broken femur, particularly in the case of the upper third, or the neck at the head of the femur, you are only adding to your trouble, because you are giving a larger weight for the dog to swing about, and I have not seen any arrangement by means of which one can keep the two ends of the bone in perfect juxtaposition. There is bound to be a certain amount of movement, and if you add weight to the end of the limb you are only making matters worse.—G. H. LIVESEY, M. R. C. V. S., Brighton, England, in *The Veterinary News*.

STRYCHNINE POISONING IN THE DOG

While I have nothing new to advance in cases of poisoning in the dog, I have seen so many methods of treatment advocated that I thought a method which I have employed for some time with good success, might be of interest to your readers. The first thing is, of course, to empty the stomach, and for this nothing can approach apomorphine, grain 1-20, hypodermically.

I have seen 1-20 of a grain of apomorphine hydrochloride cause a good-sized hound dog to vomit repeatedly, and I have also given the same dose to a small fox terrier without ill effects. Apomorphine possesses the great advantage over other emetics for strychnine poisoning, that it can be given hypodermically, thus avoiding any likelihood of causing the strychnine already in the stomach to be dissolved.

After the stomach has been emptied I administer a hypodermic of H-M-C according to the size of dog. This not only eases the spasms, but is also antagonistic to the strychnine already absorbed. I do not attempt to give symptoms, as I am writing for the profession, and I do not claim originality for this treatment; but I do claim that is a case is seen in reasonable time after the poison is consumed by the dog, that the above treatment will cure ninety percent of the cases.

EXPERIENCED.

——, Alberta.

Twenty-five of More than 300 Requests for the Canine Department

Enclosed find my check for $2.00, for which renew my subscription for another year to your A No. 1 journal. I trust that you will establish a department of Canine Medicine. We all need it, and it will improve your already excellent journal immensely.

L. C., D. V. S.

— Ohio.

By all means establish the Canine Department. It will be an excellent and instructive addition to VETERINARY MEDICINE, which is a journal that pleases me very much.

F. F.

—Washington.

VETERINARY MEDICINE is always a welcome visitor. I shall be glad to see you add a department containing information on canine and feline medicine.

C. C. S.

—Michigan.

VETERINARY MEDICINE is a good one. I enjoy it much and get a great deal of good from it. I would be very glad to see you establish a department for the canine and feline practice. Most of us need more information on these subjects.

W. E., D. V. S.

—Iowa.

VETERINARY MEDICINE is a welcome visitor at my office and I congratulate you upon the way it has improved since its inception. I think a series of articles on canine and feline medicine would be thoroughly appreciated, and add another useful feature to your already unequalled publication.

A. A. L.

—Saskatchewan.

I hope to see a Department of Canine Medicine established in your already good and ever improving journal.

A. G. A.

—Illinois.

Canine practice constitutes a considerable part of the business in many localities and nets proportionately more profit than the practice of the larger animals. Such a department in VETERINARY

(Continued on page 17)

POINTED OPINIONS ON LIVE TOPICS by Readers of Veterinary Medicine

It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the thanks of the editor, the approval of the veterinary profession and the lasting gratitude of those who are aided by your suggestions.

Kansas Veterinarians Have Only Themselves to Blame

Editor, VETERINARY MEDICINE: I received your letter in regard to the drug bill that was at that time before the Kansas legislature, and I immediately wrote to the representative and the senator from this district, also to several other legislators, with whom I am acquainted, and I must say that while it may have been unnecessary, at the same time it helped to stop the progress of the bill. I am very much obliged to you for your trouble in letting us know what was happening, and I want to thank you for showing so much interest in the welfare of Kansas veterinarians.

What I wish to write you about more especially is the present condition of our veterinary law and some of the causes that have brought about this condition.

We, as veterinarians in Kansas, have no one to blame but ourselves for this rotten condition. I say rotten because it is about the best term to express it, without being profane. If you will make a few inquiries among the members of the state legislature and also among their constituents you will find that the sins of a number of the "graduate veterinarians" during the unfortunate condition among horses in Kansas last fall, are now being visited upon the whole profession, with big interest, and it is going to take some time to overcome the damage already done to our reputation and standing, to say nothing of what more is liable to follow.

When veterinarians holding a diploma of a recognized school and posing as "state's experts," go around over the country *pretending* to do things and doing nothing but charging, defrauding their unfortunate victims, just as though they were doing a beneficent act, it is no wonder that the people get tired of us. How can we ask the public to give us any legal advantage over the non-graduates, when we go about fleecing the people in a way that would be absolutely shameful, even during normal, or prosperous times? To carry on this kind of a deliberate graft under guise of being a graduate and a *state expert* at a time when the horse-owning public was in extremity, was enough to cause the succeeding session of the legislature to come back at us in no unmistakable way, and this they did. I am not surprised, as I heard it coming last fall when I was out west trying to help the people find out what was killing their horses.

I am sure that my own hands are clean—that I did not rob them; the first four weeks that I was in the west I did not make expenses; after I began using the vaccine I made a little money, and I am not a least bit ashamed of it, as I still firmly believe that the vaccination did a whole lot of good; but I know of veterinarians, two in particular, who boasted that they took in sixteen hundred dollars in twenty days for services that they do not

even claim were, or were expected to be, of any value. And I know of several other instances along the same line that are simply shameful. I talked to several members of the legislature and they would at once pounce upon *us* as *graduate veterinarians* for simply robbing them, and would go on and tell me of some empiric that was riding night and day, trying to do some good, and was refusing to take the money unless they did some good.

I worked four years trying to get the veterinary practice act that we had, poor as it was, and it certainly makes a fellow feel like grumbling to see the whole thing knocked into a cocked hat, like it now is, on account of improper action on the part of our own men. That there was grafting done outside of the profession I well know, but that did not hurt us like the grafting that was done by our brother practitioners.

The condition of our law at the present time is not likely to be improved right away either; as there is still some people that are not satisfied and declare that they are going to see the whole thing repealed at the next session. Of course the next session of the legislature is a long ways off and they may forget it by that time, but I am afraid that the ice will be so thin under us that we will not dare to go out and ask for much improvement at the next session.

As it is we will have two years for open registration and at the close of that term every one in this state and all in the adjoining states that even think that they would like to practice some time in the near future will be registered, and there will be only one way to rid the state of them, and that will be to get a law that requires every one who practices to take an examination, regardless of who they are or where they come from.

We now have a larger appropriation for our examining board, and nothing for them to do. We certainly are in a deplorable condition, and when we sum it all up we have no one to blame but *ourselves, us, we graduates. We* caused it all. If we had kept our hands clean last fall we would have had a far better chance than we did with the legislature.

Now we must begin at once and try to repair the damage done out in the field, and if we succeed in having this well done at the opening of the next session of the legislature, we might secure some repairs for the demoralized veterinary law; but I firmly believe that we should do all we can during the next two years to overcome the present antagonistic feeling that exists among our clients. It is certain that if we cannot overcome that, we will fail to accomplish the other; but let us be very careful and try to cause a different feeling towards us as professional men.

H. S. MAXWELL.

Salina, Kan.

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[Doctor Maxwell was not the only one who "saw it coming." Two months before the meeting of the Kansas State Veterinary Medical Association last January there were plenty of its members who asserted that a "house cleaning" was the only thing that would remove the disgrace brought upon the profession by the quackery and fraud to which a few of its members resorted during the late "horse plague."

These men were right. Had the State Association, at its annual meeting, expelled perhaps a dozen of its members whose grafting was flagrant, and gone on record as thoroughly condemning such actions on the part of veterinarians or anyone else, they would then have been able to go before the State legislature and hold up their heads like honest professional men, as, indeed, they are, with very few exceptions.

Perhaps the worst violators of professional ethics and honest practices were veterinarians from other states. The Kansas Association had the opportunity to officially report the action of these men to the associations of the states from which they came, and thus "clear its skirts" from blame on this score. But it did not do this either. The whole meeting seemed to be controlled by a desire for peace and harmony and a get-together spirit, which, by its silence on the subject, tacitly condoned all that had been done in the name of the profession during the past few months.

A good stiff backbone and the courage to stand for what is known to be right and to

condemn what is unqualifiedly wrong, is as valuable an asset for an organization as for an individual, and the willingness of veterinary associations to "clean house" before asking for legislative favors needs careful culture.

In short, there are a few members of the Kansas State Association, and, perhaps, of every other state association, who should be expelled from its membership, and there is a considerably larger number of veterinarians outside of the associations who should be publicly and specifically condemned in resolutions passed by the association and given to the public press. With evident, complacent satisfaction, if not with a spirit of boastfulness, the secretary of the Kansas Association recently issued a statement in which it was shown that nearly every qualified veterinarian in the state of Kansas was a member of the State Association. This shows a commendable effort on the part of the secretary to interest all qualified men in the affairs of the Association, and is a hopeful sign of progress, and augurs much good to the profession of the state, but in view of the fact that an Association as great as this could not officially issue one protest against some of the most flagrant violations of professional ethics imaginable, it does not speak so well for the quality of this membership.—ED.]

FATAL OBSTRUCTION IN THE COLON

I was called on the morning of May 5th to see a sick horse. On arriving, I made a close examination and diagnosed the trouble as impaction colic. The animal's pulse was forty-two per minute and strong; respiration 30; temperature 102° F.; was not suffering a great deal of pain at the time.

Treatment.—I gave him one dram of calomel and four of aloes, a one-ounce capsule of turpentine and another of spirits of camphor. Exploration of the rectum revealed nothing abnormal; about eight quarts of clear, luke-warm water was injected and repeated in four hours.

At this time I called Doctor Phelps in consultation. The doctor made a close examination and agreed to my diagnosis. He suggested a drastic purgative, so the patient was given one grain of arecoline and one-half grain of strychnine, which was repeated in one hour, without the strychnine, but we did not accomplish anything. It was now two o'clock in the morning, so we decided to quit him and to relieve the pain gave him one ounce of cannabis indica, and went to bed. Two hours later I went to the barn to see what had happened, and found him quieter and resting, pulse strong and full, breathing normal.

In the morning the owner wakened us and said the horse was still sick. We hastened to the barn and found the horse fighting with pain, pulse weaker, respiration increased, temperature 102° F. He was given a heart stimulant and later one grain of arecoline. We talked it over with the owner, and decided to give him a drastic purgative, and gave him intravenously seven grains of barium chloride, but it did not have any effect. The dose was doubled and repeated in thirty minutes, and to our surprise it never touched him.

At five o'clock that day the horse died, and we held a postmortem examination. We found the stomach filled with fluid, small intestines extended and filled with fluid and very much inflamed, the large intestines were not extended, and the contents were dry and hard. The cecum was half empty and with the contents dry and hard, at the origin of the floating colon there was a hard, dry, funnel-shaped mass as large as a two-gallon bucket, which closed the outlet to the floating colon. We were satisfied this had caused the trouble, but the question arises: Why didn't the contents of the small intestines empty itself into the cecum? What could have been given to dissolve the large mass? Can any of the readers of the journal suggest treatment?

R. ARBEITER.

Marion, So. Dak.

[This case is not an unusual one, and the symptoms given are such as to lead one to make a correct diagnosis in advance of the postmortem examination, particularly

if this animal's teeth were in bad condition and it had been fed alfalfa hay. The essayist does not state that this was the case, but the symptoms and course are so typical for cases of impaction due to alfalfa, that one might almost assume that the animal was somewhat aged, its teeth defective, and that it had been fed alfalfa hay.

The fact as to what caused the small intestines to be tightly filled and the cecum, and particularly the large intestines, only partly filled, is explained by the antiperistalsis, which always occurs in cases of this kind.

The repeated use of a stomach-tube and the trocar as needed, would have prolonged the life of this animal five or six days and have given time for a positive diagnosis, and under the circumstances a laparotomy would have been in order. It is probable that with the moistening of this obstructing mass by intestinal secretions, that could have been brought about by two or three days' treatment, a direct manipulation of the intestine would have been successful in breaking down the obstruction and facilitating its removal, and that the intestine would not need to have been incised.

The early use of the stomach-tube, and the repeated use of it, as often as the stomach is filled by antiperistalsis, will prolong life in all such cases as these, and will save the animal in many cases where the impaction is a less formidable one.—ED.]

HOW IT LOOKS TO A MAN UP A TREE

As a reader of your valuable journal I see the letters pro and con regarding the American and English veterinarian, and think it is rather long range firing. The average country V. S., I think, is not particularly interested, as we think the one is advertising his wares, and the other defending his college.

I have examined the cut of Doctor Conkey's hobbles, and think they are all right for a well-broken horse. However, I castrated about two hundred colts last spring, and have now a larger number for this year. The majority of these colts have never had a hand on them, and are past grand masters in using all fours. I would like to see Doctor Conkey get all his regalia on some of these colts, as we have to choke many of them down to touch them.

Filing a remonstrance

No doubt his method is good with a work horse or the children's pet (and he doesn't need them for these, for they can be castrated to the best advantage standing), but for my part I will stick to the sidelines, as I am too slow to dodge the feet of some of these fellows. I hope to see something more instructive next time these gentlemen make a contribution.

W. L. H.

Kelcher, Sask.

BOVINE PLEURISY

Pleurisy is an inflammation of the serous membrane lining the chest cavity and enveloping the lungs. It is rare as an independent disease, but often complicates pneumonia, and often may be due to the same germ that causes pneumonia—pneumococcus.

Often seen after exposure to cold or wet, or often from external violence, and usually present to some extent in cases of fractured rib, with or without a penetrated wound.

Symptoms.—There is great pain in the first stages, this may be aggravated by movement. The animal is stiff as though foundered, pulse quick and hard, breathing abdominal, the chest fixed so far as possible,

the inspiration short and jerky, the expiration longer.

The pain is due to the inflamed surfaces of the lungs and chest coming in contact. The sound at this stage resembles one made by rubbing two pieces of sole leather together, a dry friction murmur.

Pressure between the ribs causes the animal to flinch and grunt. The muzzle is hot and dry, mouth shiny, secretions scanty.

After a day or two, the severity of the symptoms are much lessened; the temperature, which during the first days may have been as high as 106° F., falls to 103° or 104° F. The pain decreases, the stiffness disappears, and the patient eats a little. The pulse softens, but remains quicker than normal.

The patient loses strength day by day. The friction sound disappears as the exudation moistens the pleural surfaces. Percussion shows a horizontal line of dullness, which day by day rises higher in the chest, respiration more frequent and labored, the countenance is anxious and haggard, the eyes sink some in their sockets, and in unfavorable cases death occurs during second or third week, either from asphyxia or heart failure.

Diagnosis.—In pleurisy the elbows are usually turned outward. Care should be taken to differentiate pleurisy from traumatic pericarditis.

In the latter condition the area of dullness of the heart is much increased and usually a splashing sound is heard with each heart beat.

Another diagnostic symptom of value is in traumatic pericarditis, respiration is painful, not difficult, and the respiratory rate is much increased on movement.

In both conditions considerable swelling of the dewlap may be noticed in the later stages.

Treatment.—Good hygienic surroundings and good nursing are essential in connection with the medical treatment.

Prognosis.—The probability of recovery depends upon the extent of the inflammatory area. In early stages use febrifuges to reduce fever. If pulse is strong, use Fleming's tincture of aconite, one to two drams every four or five hours for a short time. Veratrine hydrochloride in one-quarter grain doses is beneficial.

For relief of the cough give an electuary composed of potassium chlorate, eight ounces, fluid extract of belladonna, two ounces, powdered opium, one ounce, powdered licorice root, eight ounces, syrup sufficient quantity: mix. At frequent intervals place a small tablespoonful on tongue or back teeth.

The bowels must be kept relaxed. This may be done by the use of calomel, one to three drams, which acts as a cathartic and febrifuge. Keep the kidneys secreting freely.

In the stage of effusion give the following three times a day: Tincture of digitalis, one ounce; iodide of potassium, thirty to sixty grams, mix.

Apply strong counterirritants to chest, such as mustard plaster, turpentine, ammonia, liniment or cantharides.

If collapse of the lung is threatened, perform paracentesis thoracis, which consists in puncturing the chest cavity and drawing off a part of the fluid.

The instruments used are a small trocar and canula, which are introduced between the eighth and ninth ribs. This seems only to relieve for a while, as there is a tendency for the fluid to accumulate again.

. . . . . .

The foregoing is in substance the classical treatise on pleurisy in cattle, as I learned it in the U. S. College of Veterinary Surgeons of Washington, D. C., from which I graduated only one year ago. Bovine pleurisy is prevalent in this community, and I, being young in this profession, would be glad for someone of more experience to write on this particular condition.

We have no state board in this state, nor any laws regulating veterinary practice, so you may know the amount of wrongs done by the so-called "quacks" we have to right.

I will relate one or two of many cases of theirs that I have been called to finish.

A bay gelding received a calk wound while working in a log team, and one of those fellows was called, and his treatment

was antimony chloride, mercurial ointment and pure carbolic acid.

This treatment had been carried on for some days, when I was called, and, needless to say, he was beyond the aid of any line of treatment I could administer. That is to say for me to treat and after an uncertain recovery, which would take some time and counting all, I ordered the horse destroyed, because counting his future usefulness, age, expense, and all counted would save the owner money in the end to do away with him.

The second case was a two-year-old colt supposed to be choked on a head of cane or a piece of corn cob.

The treatment they had administered was to thrust buggy whips down his "neck" and one, I was told, used a piece of common fencing wire with a nice hook bent on the end and fished for the foreign body, but unsuccessfully, only to lacerate the soft palate and walls of the esophagus.

Those are only two of the many cases I have had in the short time I have been in practice here. Do you not think we need some protection for our livestock, and for men who have educated themselves to be of service to the livestock interests?

CECIL HAYS, D. V. S.

Glenville, W. Va.

HYDROGEN PEROXIDE FOR INAPPETENCE

Noticing in the April number of your valuable journal that you desire articles on cattle practice and their diseases, it occurs to me that literature on this subject is not any too abundant. I think it mainly because country practitioners, as a rule, are not inclined to write, not so much because of wishing to keep their knowledge to themselves, as that they are too busy trying to keep body and soul together.

I am not writing from an entirely unselfish motive, as I hope others will fall in line, and that we may mutually benefit by a discussion of the ideas and experiences of a large number of country practitioners.

I happen to be engaged in practice in a dairy section, and much of my work is among cattle, principally dairy cows.

I have in mind a case as follows: On April 16th, 1911, a client of mine asked me to go to his home and examine a cow. The subject was a small, five-year-old Ayrshire, grade cow in fair condition, due to freshen in about two months. The pulse, respiration and temperature were normal, as was also a quantity of feces she had just passed. The owner informed me that she, as well as several other cows and yearlings in the barn, had been fed on clover hay and almost two quarts of bran and cornmeal twice a day, but for the past two days she had eaten nothing. I promptly gave one and one-half pounds of Epsom salt and prescribed the usual treatment of nux vomica, gentian, etc.

April 18th there was no apparent change except that patient was losing some flesh, no distention with gas or any physical symptom of pain whatever. To all appearances she was as healthy as any normal cow, but steadfastly refused to eat or drink. I melted about a pound of lard and gave her, continuing the other treatment along with a little ginger in some milk. Her feces were still normal, except in quantity, which would naturally diminish under the circumstances.

April 20th the owner informed me that there was still no inclination to eat or drink, and he was getting tired of pouring medicine, milk and eggs into the cow with no result.

Remembering that peroxide of hydrogen would sometimes aid as an appetizer, I administered four ounces in equal parts of water, the same dose to be repeated four times daily until result. This was in the morning, and on the evening of the following day the owner informed me that the cow's appetite had returned and that she was apparently as well as ever. There was no return of the inappetence.

I have since had several similar cases, on the same treatment, terminate as happily as this one, and I consider peroxide about the best appetizer we have in cattle practice.

I now use it sometimes in combination with gentian, and have also used sulphocarbolates, but if confined to one drug I prefer the peroxide.

Whether the favorable result is due to its action as an intestinal antiseptic, or to the action of the oxygen being freed and working its way through the manifolds, is a question, but I am inclined to think the latter, as in most of my cases there has been little or no fetid odor to the feces.

I had a case the forepart of this month (April, 1913), where peroxide seemed to have no effect. The subject was a work ox. The illness was ushered in by high fever and some uneasiness after doing a hard day's work, and was followed by persistent constipation. This animal did not eat for ten days, and finally died. I was injured by a horse and unable to attend my duties four days previous to his death, so could hold no postmortem examination. I forgot to state that the steer's temperature was down to normal in two days from the beginning of illness.

I would like reports of other practitioners on this trouble in cattle, where symptoms are scarce, except that they will not eat or drink. There is probably impaction of the omasum in the majority of these cases.

I consider the digestive diseases the hardest problems to deal with in cattle practice. In obstetrical work we can see or feel what there is, but in obscure digestive cases I am afraid many of us are content to look wise and follow a general line of treatment.

If anyone is holding back anything that may be of benefit to brother practitioners, kindly relate your experiences.

J. V. HILLS.

Gowanda, N. Y.

ANTISEPTIC OIL

This antiseptic oil is now being used in three of the largest veterinary hospitals in this state, and with great success in a great number of different conditions. It is made as follows:

Carbolic acid crystals (melted)	8 oz.
Creolin (Pearsons)	8 oz.
Wood alcohol	8 oz.
Castor oil, C. P., q. s. ad	1 gal.

Melt the carbolic acid crystals in a water bath; when melted add to the creolin; next add the wood alcohol. This mixture is then added to the castor oil.

Common ethyl alcohol will not produce the same results in the mixture as the wood alcohol, and should not be used. In place of using all castor oil, raw linseed oil may be employed half and half with the castor oil, also oil of lavender may be used to give it a pleasant odor.

In all forms of mange in dogs, cats, horses and other animals we have yet to find the case that does not respond to treatment; in all forms of wounds, cuts, bruises, burns, eczema, and in all operations it is used as the dressing.

I want to say that in all the cases that this has been used on (and that is a great many thousand), I have never seen a drop of pus or any other kind of infection. This is not alone confined to the veterinarian for use on animals, as numerous physicians of my acquaintance are using it with good results.—A. O. LONGLEY, Stockton, Cal., in *The Physicians' Drug News.*

—

[In many states there is a law (and there should be one in every state) prohibiting the use of wood alcohol on man, either internally or externally. It is probably equally as harmful to animals as it is to man. Liquor Cresolis Compositus (U.S.P.) possesses many advantages over creolin and costs thirty percent less.—ED.]

HUMANE NOSE TWITCH

I note an article on how to make a good twitch, in the January, 1913, number of VETERINARY MEDICINE, page 54. In cases of necessity a twitch like that will do, but it does not look well for a veterinarian to use such things. Here, in this picture, I show you a small and light twitch. I have given to this instrument, which is my own invention and patent, the name of "humane nose twitch." It is humane, because it will never injure the nose of the horse, like the rope twitch or other devices.

Humane twitch

I would like to tell here of one single case in which if I had not had the humane nose twitch, I would not have been able to do the work which I did. February 22, 1913, I was called at 10:30 p. m. to the Street-Chatfield Lumber Company to see a horse which had been kicked by its mate, which was loose and walking around in the barn. I found on the triceps abductor femoris of the left leg a triangular cut, one foot long vertically, and of an equal length horizontally, another cut on the triceps abductor magnus, left side from the anus, six inches long, and another from the roof of the coccygeus to beginning of the sacrum.

The only help I had was that of the watchman with his lantern. In the daytime I would simply have thrown down the horse, but what could I do at night with only a single helper? I tied the horse's head up short and put a blanket around his body, tying it with a rope to the wall of the stall. I then gave a hypodermic injection of 0.8 Gram of morphine and put the nose twitch on. After this I had to clean my hands because they were dirty from tying the horse. The watchman lighted with the lantern and I sutured the edges of the wounds together. It was hard work, but the one good thing I had was the humane nose twitch, because as soon as the horse began to be restless I had a chance to screw the twitch always a little tighter. I finished my work without much trouble and pretty quick, because at two o'clock I was in my bed again. The wounds healed by first intention.

I heartily recommend this instrument to every practicing veterinarian. It is nickel plated and will last for a lifetime; it may be carried in the instrument bag, in the medicine case, or in the pocket, and is always at hand.

FRANK PFUSTLER, D. V. S.
1729 N. Halsted St., Chicago, Ill.

"BRISKET DISEASE"

We have in this state an ailment of cattle, known to the ranchmen as brisket disease. It is more or less prevalent all the year round, but is more common in the early fall and affects chiefly two-year-old steers, though aged animals and some calves succumb to it. In this county during the past fall and winter I am quite sure that 200 head of cattle died of it.

The disease is very chronic and the only symptom, as given by the ranchman, is a swelling of the brisket, which increases in size as the disease progresses, and finally extends over the neck; the appetite is poor, and toward the end in entire abeyance. I have not observed any additional symptoms antemortem, as the animals are very wild, and it is difficult to get close to them, but in a few that I have held autopsies on all have had pneumonia, pleurisy and hydrothorax. I am quite sure, though, that pneumonia cannot be present in these cases from the beginning, since the course is much too chronic for pneumonia.

I shall be glad to receive further information on this subject.

M. R. BLACKSTOCK, D. V. M.
Gunnison, Colo.

SOAP FORMULAS

Will you please send me a working formula for making soft soap with linseed oil; also if the raw or boiled oil is used. I have been using an automobile soap which is claimed to be made with linseed oil, but it costs me 20 cents a pound by the five-pound pail, and that is a little too expensive for general use. It seemed to me that it could be made much cheaper.

FRANK B. STRATTON, M. D. V.
Swampscott, Mass.

[Henley's Twentieth Century Book of Formulas gives the following, for the manufacture of soaps, which may serve your purpose. Use the raw oil in each case.

1. Sopo Mollis

Olive oil	100 parts
Solid potassium hydroxide	21 parts
Water	100 parts
Alcohol (90 percent)	20 parts

Boil by means of a steam bath until the oil is saponified, adding, if necessary, a little more spirit to assist the saponification.

2. Instrument Soap

A soap for cleaning surgical instruments, and other articles of polished steel, which have become specked with rust by exposure, is made by adding precipitated chalk to a strong solution of cyanide of potassium in water, until a cream-like paste is obtained. Add to this white castile soap in fine shavings, and rub the whole together in a mortar, until thoroughly incorporated. The article to be cleaned should be first immersed, if possible, in a solution of 1 part of cyanide of potash in 4 parts of water, and kept there until the surface dirt and rust disappears. It should then be polished with the soap, made as above directed.

3. Soap Substitutes

Linseed oil	28 pounds
Sulphur	8 pounds
Aluminum soap	28 pounds
Oil of turpentine	4 pounds

4. Dog Soap

	Parts by Weight
Petroleum	5
Wax	4
Alcohol	5
Good laundry soap	15

5. Liquid Tar Soap (Sapo Picis liquidae)

Wood tar	25 parts
Hebra's soap spirit	75 parts

If you find any of the above better, or as good and less expensive than soaps you can purchase, report your results in these pages.—ED.]

PNEUMOTHORAX IN A COW FROM ECHINOCOCCUS

A cow had been ailing for a fortnight; she was dull, with loss of appetite and milk, there was subcutaneous emphysema in the region of the right shoulder. Examination of the lungs revealed pneumo-thoracis on the right side, with a hole between the eighth and ninth ribs, and a similar hole near the right kidney; the skin was sound over both, which appeared to have existed some time. Two weeks later, the day before slaughter, the subcutaneous emphysema had spread over the whole body. The right lung produced no respiratory sounds, the left lung appeared to be normal. Temperature was 38.4 C.

Postmortem examination revealed a large air-bladder near the kidneys, especially on the right side, the kidney fat was filled with air, which had penetrated its whole structure. There was no sharp body among the organs which could have caused the holes, but in the lungs there were some echinococcus cysts, one of which on the right had ruptured, it was on the edge of the lung and when one squeezed the lung, air came from the cyst, which acted as a bellows valve and forced the air through the hole between the ribs, filled the subcutaneous tissue and kidney fat. The case appears to be unique.—(N. Foss, Ufa, Russia.) Trans. ex Esperanto.

—*The Veterinary Record.*

MERILLAT'S CARDINAL RULES OF SUCCESS FOR A VETERINARY PRACTITIONER

EDITOR'S NOTE.—In the spring of 1905, near the close of the session of the Chicago Veterinary College, a member of the senior class, at clinic one day, asked Dr. L. A. Merillat for his cardinal rules of success for a veterinary practitioner. Dr. Merillat turned to the blackboard and wrote the rules given below, which were copied in the said student's note book at the time, and there they have remained ever since, until resurrected recently in looking for another matter. As rules for the conduct of a successful veterinary practice they can scarcely be improved upon, and although they have lain in hiding eight years, are yet well worth publishing.

Rule I

Keep up with the times, by incessant and diligent study of the various branches of veterinary science.

1. Subscribe for the various professional journals.
2. Procure the new books as fast as they are published.
3. Join all of the professional associations.
4. Write professional articles for the profession to read.
5. Join culture societies, reading clubs, etc.

6. Promulgate new ideas and invent new methods, etc.

Rule II

Seek the association of the best citizens of your community, but do not offend the rabble by haughty actions.

1. Go to church and contribute to its support.
2. Be public-spirited and take an active hand in the live issues that concern your community, your state and your country. Show your power in public affairs.
3. Join good fraternal societies and endeavor to become prominent in their management. Be a "bell cow."
4. Abstain from the use of alcoholic beverages. Remember your failing.
5. If you do drink——. The Shriner's toast.

A fool's a fool and a cad's a cad,
Whichever he's intended to be,
But a man that's a man, won't forget he's a man
When he's out on a bit of a spree.

Rule III

Be strictly honorable in all of your professional transactions, and live up strictly to the prevailing ethics of the profession.

1. Non-ethical men are seldom permanently successful.
2. Seek publicity by good acts, but never by advertising.
3. Never involve your clients in unnecessary expense.
4. Never accept a fee from the seller of an animal nor issue fraudulent or deceptive certificates.
5. Insist upon a reasonable fee for your work, never work cheaply and never make an exorbitant charge.

Rule IV

Keep conspicuously in mind that the natural resisting powers of the body are much more influential in healing disease than the action of medicines.

1. Avoid complicated mixtures.
2. Help your patients by mechanical means as much as possible.
3. Practice surgery judiciously and never perform operations where there is little chance of success.

ENORMOUS BLOOD CLOT IN A COW

In regard to your editorial note setting J. F. B. into the straight and narrow way, I am writing to report on a case of ruptured milk vein, in a young cow. This was a red cow, with white spots. A large tumor covering axillary space, and whole side of a doughy yet elastic consistency was diagnosed as a possible rupture, which diagnosis was borne out, although the writer little knew that it was a rupture of a vein.

Operation being offered and assented to by the owner, the field of operation was given the usual preparation that is so carefully observed, especially when operating in the field and upon the cow. As nearly a clean field was secured as possible, and upon exploratory incision at the upper border of the tumor a blood clot of semi-solid consistency was encountered.

Careful enlargement of the incision was followed by the removal of one portion of the clot after the other, until a pile of the clots in a mass, larger than a bushel basket, some being as large as lobes of a cow's liver, had been torn from the clot and removed with little bleeding, and a small quantity of straw-colored serum evacuated from pendant portions of the smooth-walled tissues surrounding the clot.

The diagnosis that went with the favorable prognosis and was followed by "an uneventful recovery," was a "rupture of a milk vein." Violent contact with one of the weapons of offense and defense that were quite common and even somewhat popular in cow millinery in those days, possibly caused the puncture in the milk vein, near where it emerges from internal regions to denote pailing possibilities.

C. B. KNOWLES.

Sioux City, Ia.

MALLEIN UNRELIABLE BY 30,000 TESTS

In your May number, just received, I notice an article entitled "Hunting on the Use of Mallein," in which the author dis-

agrees with the opinions of many eminent authorities in our profession, and gives as a basis for his position the results obtained in London since a certain glanders order came into force.

For the information of my profession I desire to state that during the Boer War I entered into a contract with the British Government to test with mallein, horses and mules shipped to South Africa through this port, and I tested under the contract thirty thousand head of mules and horses, about one-quarter being horses. A great part of this work was done in conjunction with Professor Williams, sent here by his government on account of his standing as a leader in the profession in that country.

We destroyed and examined ten mules after perfect mallein reactions, and not one of them showed a sign of glanders. Several thousand that reacted we quarantined for two or three weeks, and afterward shipped them in ships carrying 1200 head for a thirty-day voyage, and there was never a report of glanders.

Williams, when he came here, thought well of mallein, and was, in fact, prejudiced in its favor, and on account of the failure of the test condemned the American product and ordered mallein from England and then on the further failure he ordered it from various parts of the world. Always the result was absolute failure of the test. Professor Williams, before he left, expressed the opinion that mallein for testing mules was worse than useless, and that it was of very uncertain value as a test for horses.

My opinion is that as a test for glanders in horses and mules mallein is worthless, and that its supposedly diagnostic reactions have caused the destruction of many healthy and valuable animals. To cover its failure some of its advocates have even gone so far as to contend that it is a cure for glanders.

In my experience, glanders is a slow spreading, easily eradicated (I don't mean cured) disease, which gives the practical veterinarian no uneasiness, and if mallein was efficient as a diagnostic agent there would be no reason for its use except in the case of long shipments on crowded vessels, such as obtained during the Boer War.

Not long ago I met a young veterinarian in the government employ, who, after a conversation with me on the subject of mallein testing, said that he had recently crippled the fortunes of several men in Florida by having most of their livestock destroyed on account of the reaction to mallein. He said they were healthy looking horses, and if he had it to do over again, not one would he have destroyed.

F. B. Ford, D. V. S.

New Orleans, La.

Dr. L. M. Hunt, of Pasadena, California, has been appointed county veterinarian by the Board of County Supervisors, to succeed Dr. Ward B. Rowland, who has been county veterinarian for many years and was recently promoted by Governor Johnson to the position of state veterinarian for Southern California.

The promotion of Doctor Hunt leaves a vacancy in the office of the city veterinarian of Los Angeles. There are but four other veterinarians in Los Angeles qualified for the position: T. A. Agnew, formerly of Evanston, Illinois; C. W. Barrett, R. J. Barton, and W. A. Boucher, none of whom is a candidate for the place.

—

Dr. Geo. Rennicks, formerly of Sauk Centre, Minnesota, has been compelled to leave Minnesota on account of illness in his family. He is now located at Bay Shore, Michigan, but is anxious to get back into Minnesota.

ARMY VETERINARY LEGISLATION ASKED

Dr. W. Horace Hoskins, 3452 Ludlow street, Philadelphia, Pennsylvania, has caused the Army Veterinary Bill to be introduced at the special session of the 63rd Congress, in the hopes that if it is not reached in this session it will come up for consideration early in the long session beginning next December. This bill is known as H. R. No. 4541, and differs from the Army Veterinary Bill presented to the last session of the 62nd Congress in that it provides for the rank of Captain instead of First Lieutenant; permits of the retirement

from the Quartermaster's Department of those entitled by age, disability or other causes, and gives credit for examinations to those who have been in the service twenty years or more.

In the Senate the bill is known as S. 1303. It is expected that the only serious opposition to the bill will be in the upper branch of the National Legislature. The bill is a meritorious one, and Doctor Hoskins should be accorded whatever support he asks of veterinarians, in the interests of this measure.

NEWSPAPER COMMENT

Dr. C. B. Knowles, Sioux City, Iowa, treasurer of the Hawkeye Veterinary Association, writes us that our paragraph on page 296 of the May issue of VETERINARY MEDICINE, in which reference to him was made in connection with the new Stallion Law and other veterinary legislation, is misleading, in that it says that Doctor Knowles and his associates attacked the present Veterinary Practice Act in Iowa; whereas the fact is they did not attack this practice act, but always have, and do now, support it. Doctor Knowles' contention is that men who have practiced seventeen years in a state should know how to examine a stallion for soundness or should quit practice, and that the people weed out the unworthy. He says that "a lawyer is asked 'What do you know?' and not 'How long did you board near a place where you could have attended lectures had you been interested?' Competency and efficiency should be the test."

The statement in our May issue, mentioned above, was taken verbatim from the *Des Moines Leader*. For this and other newspaper clippings we assume no responsibility, but give them only for what they are—newspaper clippings.—ED.

VETERINARY DIVISION, M. A. C., RECEIVE $153,000 INCREASE

An error due to reprinting newspaper reports is called to our attention by Dr. R. P. Lyman, dean of the Division of Veterinary Science of the Michigan Agricultural College.

In the May issue, on page 297, it was stated that the valuation of livestock in Michigan is $2,000,000, while the fact is that the valuation is in excess of $137,000,000. We are pleased to announce also that in addition to the appropriation announced in the May issue, the Veterinary Division of the Michigan Agricultural College has recently received an additional appropriation of $153,000, and the chances that it will be granted a new and much needed building are very good.

DR. E. S. D. MERCHANT, of Glen Cove, N. Y., steams from San Francisco on May 24th, to accept the position of Assistant Professor of Veterinary Surgery in the Veterinary Department of the University of the Philippines, Manila, Philippine Islands. Doctor Merchant is a graduate of the New York State Veterinary College.

DR. LEROY C. WILSON has recently changed his location from Poseyville to West Heights, Evansville, Indiana. His departure is regretted by the many friends he has made, while in practice in the former place.

DR. F. R. WHIPPLE of Peoria, Illinois, has just added to his hospital equipment a well-fitted laboratory, supplied with a Spencer microscope. The doctor finds that a microscope is a necessary instrument in canine and feline practice.

NOTES FROM THE PENNSYLVANIA LEGISLATURE

The following bills have been introduced in the House during the present session, and are of special interest to veterinarians:

House Bill No. 962 is to amend the veterinary practitioners' act so that the Board will have authority to raise the license fee, if necessary, from one to five dollars per annum for the purpose of prosecuting illegal practitioners. It makes veterinary dentistry a part of veterinary medicine, and gives the Board, or an authorized agent, authority to bring prosecution. The Examining Board is in favor of this bill. It has passed the House. Now in Senate.

House Bill No. 1009 repeals the Butchers' Indemnity Act, under which this Board has been required since 1903 to appraise and pay for carcasses of cattle and hogs which were slaughtered and found diseased to such an extent that the meat could not be passed for food. The State Livestock

Sanitary Board favors this bill. It has passed the House, and is now in Senate.

House Bill No. 1010 is a codification of the laws of the State Livestock Sanitary Board. After their present term of office has expired the State Veterinarian is to receive $5000 and the Deputy State Veterinarian $4000. The bill will strengthen the powers of the Board in handling quarantines, interstate cattle, biological products and branding tuberculous cattle. There is no change in the organization of the Board, and no new duties imposed upon the members. Additional authority is given the State Veterinarian in order to relieve the Board from attending to routine business. The bill was carefully prepared by the Board, and has its hearty endorsement. It has passed the House and is now in Senate.

House Bill N. 1085 is an amendment to the Meat Hygiene law. The amendment is for the purpose of removing the limit of ten agents provided for in the present law. Will prevent feeding offal and handling meat by prospective purchasers. The Board is in favor of this amendment.

House Bill No. 1201 is a Milk Hygiene law—very similar to the present Meat Hygiene law. It aims to place the inspection of dairies in the hands of the Board and to prevent duplication of inspections. The Board is in favor of the bill.

House Bill No. 1323 is an amendment to the veterinary practitioners' act, reopening the registration list so existing practitioners will have an opportunity to register. This bill was referred to the Agricultural Committee and negatived through the good work of Dr. E. E. Bittles.

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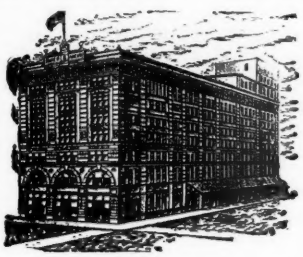

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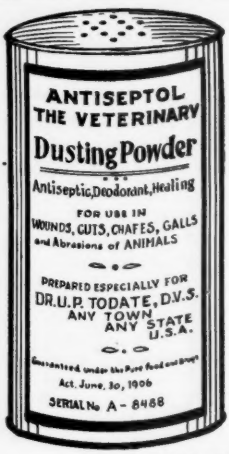

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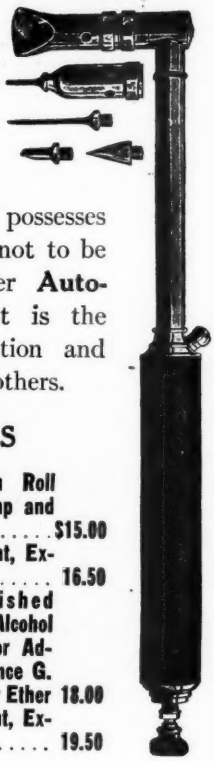

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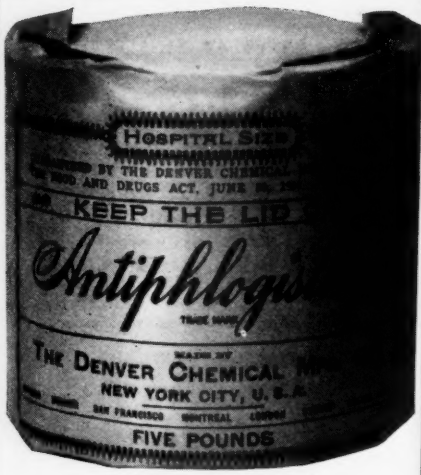

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PLAINTIFFS FILE AFFIDAVITS AGAINST DR. KUHN

Affidavits in rebuttal in the habeas corpus case of Dr. J. R. Kuhns were filed in Superior Court recently by Hugh M. Morris, representing Doctor Quill, and State Veterinary Association. Doctor Kuhns filed affidavits several days before setting forth that he is a graduate of a veterinary college, and as such is entitled to be a member of the State Sanitary Board. Among the affidavits filed by Mr. Morris was one from Dr. Joseph Hughes, president of the Chicago Veterinary College, in which he states that Doctor Kuhns is not a graduate of that college.

In the affidavit filed in the rule proper Doctor Kuhns states that he is a graduate of Queens University, of Toronto, Canada.

Doctor Knigh, dean of the veterinary department of that institution, in an affidavit declares that Doctor Kuhns is not a graduate of that university.

Doctor Kuhns also contends that he is a graduate of McPherson's Dental College of Toronto, Canada.

Mr. Morris filed an affidavit made by Doctor Hoskins, of the veterinary department of the University of Pennsylvania, in which he states that McPherson's Dental College was not a veterinary college, but a course in filing and trimming horses' teeth run for a short time by the keeper of a livery stable.

—

[The above clipping refers to a legal tangle in Delaware.—ED.]

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4
HI ! LEGGO THAR
2
BUT THAR'S THE STUFF THAT WILL DRIVE THE BILE BACK INTO THE DUCKS AGIN.
5
TIME I WUZ MAKIN' OUT MY BILL.
3
AN' IF WE KIN STOP THE OVERFLOW OF THE PEDESTAL-
6
DOC 'LL SOCK IT TO ME FER THIS VISIT I BET.
T. BROWN

ANOTHER CALL FROM DOC VETTER

The Doc Vetter pictures in our March issue were greatly appreciated by many and there been an insistent call for more. This series, like the former, is from *The Country Gentleman*, Philadelphia.

BITTER MILK

L. D. L., Deer Lick, Pa. Have a cow nine years old. Will not be fresh until April. Her milk is strong and we cannot gather the butter in churning. Her feed is ground corn and oats and fodder for roughage.

Answer: Bitter tasting or strong milk is generally caused by various plants, such as ragweed, wormwood, garlic, cabbage, turnips, etc. Also when the milking period is carried on too long. If these causes do not exist, would suggest giving one ounce of hyposulphite of soda dissolved in a pint of water three times daily. Be sure that all vessels with which the milk comes in contact are thoroughly sterilized. A hidden crevice in a churn or milk crock may hold a clot of decomposed milk or curd which will spoil any milk that it contaminates.—*The National Stockman and Farmer.*

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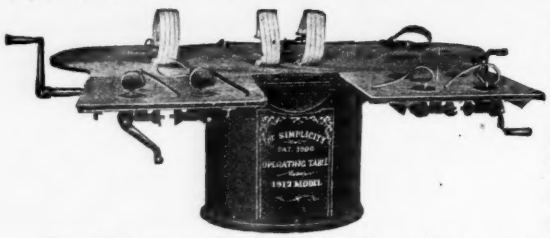

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